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OBSERVATIONS MADE DURING AN EXCURSION TO THE DISMAL SWAMP.

By the Editor.

Whoever has heard any description, however slight and imperfect, of the great morass known by the name of the Dismal Swamp, must have been interested and impressed by the peculiar features and remarkable circumstances mentioned. Yet few persons have made any personal observation of, or paid much attention to these things, except those whose near residence, and early and long continued business and habits of life, have made them so familiar with the swamp, that they have lost, or perhaps never enjoyed, the freshness of feeling which novelty would have excited. Persons thus long acquainted with the ground, do not seem to think its circumstances very remarkable, and therefore do not offer their information to strangers. On the other hand, strangers, who at least might learn the facts thus acquired by residents, do not even direct inquiries so as to draw them forth, because totally ignorant of their interest, and even existence. Few strangers would ever have been induced by curiosity to attempt the great labors necessary for even a slight examination; nor would any have probably seen more than some points on the outer margin, but for the great highways now opened through the swamp—the great canal, the road on its bank, from Norfolk to North Carolina, and the railway which dips into the northern extremity of the swamp. These passages have given to thousands a rapid passing glance at certain portions of the scenery: but in every other respect, these numerous passengers have added nothing to the scant information previously possessed by the public. No visiter has made the investigation of the peculiarities of this unknown land a main object—and still less has any person paid attention to the geological and agricultural aspects in which this region well deserves consideration. I am but little qualified, either by scientific acquirements, or by opportunity for personal investigation, to supply these deficiencies. Still, in the absence of better digested and more accurate information, I will now offer such facts as were learned or observed, during a recent hurried visit to the Dismal Swamp, together with the speculations that these facts and observations suggested to my mind. Under circumstances so unfavorable for careful or full investigation, it is not probable that mistakes can be avoided. But I am willing to hazard being found in error, in the hope that the needed corrections may be furnished, and more full as well as correct information be given, by others better acquainted with the localities.

The part of the Dismal Swamp lying in Virginia, is about 25 miles from east to west, and about 20 from north to south—that is from near Suffolk to the Carolina line. The swamp stretches perhaps 20 miles more southward within North Carolina, but with much contracted width, and limits not well defined on maps, or by report. With such minor variations as will be mentioned hereafter, the whole of this extensive region is one great morass, or quagmire, except for the partial firmness caused by its cover of vegetables, and their matted roots. It would be naturally supposed that the swamp was much lower than all the surrounding lands, and the general receptacle of the numerous streams flowing from them. But, on the contrary, the swamp is higher than nearly all the firm and dry lands that encompass it, and the interior of the swamp is generally higher than the outer parts. The only exception to both these statements is found on the western side, where for some distance, say 12 or 15 miles, the streams flow from higher land into the swamp, and supply all its abundant and overflowing water. But towards the north, east, and south, the waters flow from the swamp to different rivers, and give abundant evidence, by their courses and their rate of descent, of the swamp being higher than the surrounding drier and firm ground. I do not mean that, at the junction of the two, the swampy ground is highest. On the contrary, it is generally bordered by a flat ridge of land perceptibly, though very little higher: but this ridge slopes downward on all sides except the west, and soon descends to a level greatly below the general surface of the swamp. The accurately levelled profile of the railway from Portsmouth to Suffolk, and of the Dismal Swamp Canal, and the Land Company's Canal, all furnish still stronger and more accurate evidences of the general fact stated. The railway passes through about 4 miles of the northern extremity of the swamp—and is there higher than when on the firm land some miles away on either side; and is 6 to 7 feet higher than on firm and dry ground near to Suffolk and to Portsmouth. The central part of the swamp is 5 or 6 feet above the middle section of the Dismal Swamp Canal, which section is some 13 feet above the rivers into which it empties at both ends—and these rivers are not more than 5 or 6 feet below much of the dry but low-lying land of this generally flat country. If it could be supposed that the streams, which flow into the western part of the present swamp, had for ages been bringing, not water, but mire almost as fluid as water, the spreading of that mire over the basin of firm subsoil, which now underlies the swamp, would have caused nearly such slopes, and form of the surface, as now exist—descending from the issuing streams on the west to the centre of the area, and thence descending towards every other part of the circumference. The surrounding slightly elevated rim, and various small and narrow ridges of poor and firm land, which rise like low islands in various places above the surface of the swamp, and the gradually descending slopes from such summits under the adjacent swamp soil, all give countenance to the supposition that the swamp is a compensatively recent formation or deposite on the lower foundation.

But whence came this enormous deposite of 25 miles in width, and in many parts 10 to 15 feet in

thickness? The flood of liquid mire, which was supposed above for the purpose of illustration, of course was impossible. Neither could the deposite have been made by the alluvium of the streams —because they bring down very little, and because the soil of the swamp is not such as would be formed by such a cause. It is not principally *earthy*—as are all alluvial deposites, of every grade of fertility and consistence—but *vegetable*—and this peculiar and regular constitution may point out the origin, and explain the growth, of this vast body of high morass.

Before seeing the Dismal Swamp, and making some examination of its different soils, I had always considered that no true peat soil existed in Virginia—and that it could not form, nor remain long, if already formed, owing to the warmth and length of our summers, and the consequent ease with which vegetable matters runs into fermentation and putrefaction. I have several times incidentally expressed this opinion in different publications, and the last time, but a few days before visiting this region. (Far. Reg. p. 504 vol. IV.) I still hold this opinion, as to all common lands and localities, and in circumstances similar to those in which most peat mosses exist in Europe. But the Dismal Swamp is certainly a peat soil, or soil formed almost exclusively of vegetable matter, though the kinds of plants, and the manner of the formation, may differ much from European peats. In Scotland, the climate is so damp, and the summers are so short and cool, that in many situations, the natural vegetation of one year, if left undisturbed, will not rot during the next; and it remains, either wholly or principally, adding to the height of the surface soil, without giving it any increase of fertility. If water flows into such land, it is absorbed by the vegetable matter, and acts to give greater vigor to growing mosses, and other aquatic plants, and still more to retard their putrefaction when dead. Thus, in the situations most favorable to the formation, that is the coldest and most moist, (without being overflowed by water,) the peat grows to many feet in depth—and even on pasture lands, or arable left untilled, the surface becomes peaty or moory, having an excess of vegetable matter, but in that undecomposed state which makes a soil less, instead of more productive under tillage. Hence, the peats of Britain, whether of 6 inches or 6 yards deep, are barren, or at least tending to make a soil unproductive: and when brought under tillage, besides drainage, these soils require operations to decompose their excess of vegetable matter, to fit them for producing grain crops. For this purpose, the dry and shallow peats are pared and burnt—and the deep peats are limed, dug up and stirred, and even manured with dung, to quicken fermentation. Now no such formation of soil can take place in such a climate as ours, because the summer's heat and continuance are more than sufficient, under ordinary circumstances, to ferment all the vegetable matter that the preceding year had produced. Paring and burning the soil, which is a common and excellent part of preparatory tillage in England, on any common highland soils that have been left in pasture, could not be effected in Virginia—and if it could, would be injurious, by destroying the vegetable matter, which, if not burnt, would be decomposed soon enough.

It is true that we have soils as entirely of vegetable formation as many of the peats of Britain. Such are all the fresh water tide marshes, parts of many swamps, and the whole of the great Dismal Swamp. But the difference I take to be this. The vegetable soils, being kept constantly either covered by, or saturated with water, are kept from entirely rotting, and are increased in thickness by annual accessions of vegetables. But though not enough rotted to lose much of the bulk, they are enough so to form manure: and these lands need only perfect draining to be at once highly fertile. Then indeed the soil begins to rot too rapidly; and if kept dry, will continue to rot as long as a great excess of vegetable matter remains. Hence the opinion which I have long maintained by reasoning, and to my very great loss have seen proved in practice, that our fresh water tide marshes, if diked and drained, will rot away, as deep as they are made dry enough for tillage.

The soils of the Dismal Swamp are much nearer to the peat of Europe than any other that I have observed: indeed the upper layers of the juniper lands, to the depth of some inches, may be formed of the same mosses. But below the living roots, though still it is all of vegetable formation, the plants are so rotted they are simply a soft black mud. The general cover of all this kind of ground, under the shelter of the large trees, shrubs, or reeds, is a thick carpet of tender mossy plants, which rise to 4 or 5 inches high, and which are taken up by the hand so easily, that they seem to have scarcely any hold of the ground. Where these grow, the surface is as wet as water can make it, if not covered an inch or two. This, the least solid of the whole, is the soil most favorable to the juniper trees—which stand, barely supported by the long tap root, in these quaking bogs of of "surf" or "sponge," as this earth is called by the laborers.

The peat of Europe, or at least certain qualities of it, is good fuel: and I have but lately learned from a very intelligent gentleman who resided in Boston during the late war with England, that the peat of Massachusetts was then used for fuel, in consequence of the scarcity and high price of coal. In an article in a New England paper which has since reached me, I see the use of the same fuel recommended at this time. The vegetable soil of the Dismal Swamp, (like that of our tide marshes,) when dry, is highly combustible—and being principally of vegetable origin, would leave but little ashes, or earthy residue. But on account of being so well rotted, it would probably make but poor fuel.

The immense and continually growing fields of peat, which are spread over the earth in cold countries, are probably the materials for future beds of coal, after being buried deep in the earth by some of the convulsions of Nature which have so often changed the face of the globe. When compressed by the weight of mountains to the density of stone, the peat of the most open texture, or the most rotted and worthless, may become a coal valuable for fuel. I do not believe that geologists admit this theory of the formation of coal: but it seems to me a more plausible origin than from other than peaty matter.

It is not difficult to conceive how the soil of the Dismal Swamp should have been growing in thickness, and spreading over more extent of surface; and that it shall continue to do both, if

the existing causes are suffered to operate. The streams which flow from the western highland are sucked up by the earth, which from the nature of its composition, absorbs and holds water like a sponge: and it is thus filled or very slightly overflowed by water, and yet no part covered deeply, because the superfluous water finds or forms channels to escape into rivers, which head at various adjacent and much lower points. This continual wetness, and the extreme richness of the soil, combine to produce a prodigious growth of aquatic plants, of various kinds, and of all sizes, from the diminutive moss to the gigantic cypress. The wet soil causes more evaporation than would take place from water alone--and evaporation causes cold—and the heat of the sun is in great measure excluded by the thick cover of trees. Hence, a coldness of the earth suitable to a far more northern climate is produced, and maintained. The leaves and moss, and other vegetable matters that fall, are but partially decomposed, and thus add annually to the thickness of the soil.

As might be inferred from the operation of the causes named, but little of the surface of the swamp is many inches either above or below the water, though the level of the swamp is in some places five feet lower than in others, and perhaps much more. Standing, but shallow water tends to raise the earth to its surface: and if, by drainage, drought, or any other circumstance, a part of the land should be so much higher than the water as to become quite dry, the first accidental fire would reduce it to a lower level.

It may well be supposed, from the foregoing general description, that the swamp furnishes very difficult ground to travel upon. But I had no adequate conception of the magnitude of the difficulties before personally making the trial. In addition to the general wetness of the earth—the most dry being a mire, from sinking in which the traveller is guarded only by the mat of living roots—the undergrowth of evergreen shrubs, and vines or reeds, cause still greater impediments to his progress.

It is difficult to imagine a sufficient motive to have induced any man to penetrate a mile into the swamp, before paths we e cut and made solid enough, for the purpose of getting the timber. And these obstacles long prevented any person from going far from the borders. It was as late as some twenty years before the revolutionary war, that the lake, which is the most beautiful and magnificent feature of the region, was first discovered by a hunter, named Drummond, who had lost his way, and therefore wandered miles through this "Slough of Despond." He could not have reached the lake in the shortest line from the main land in less than three miles—and probably it was many more. What must have been the sensations of a man, so lost in such a gloomy labyrinth, when he came suddenly upon the border of this splendid sheet of wide water! Lake Drummond is nearly oval—seven miles long, and more than five wide. It has no beach, the thick and tall forest being at and in its margin. The water is generally even with, and often gently overflowing its banks--and the banks (if such they may be called) sink perpendicularly, so that whether the waters of the lake are higher or lower than is usual, it makes no difference in the breadth of the water, and but little difference in the general appearance of the shores. There may be a difference between the highest and lowest water, from the opposite effects of the wettest and dryest seasons, of three or four feet—and there would not be as much, perhaps, but for the artificial reducing of the water, in the dryest seasons, to supply the great canal for the purposes of navigation.

This beautiful lake—and which no doubt seems the more beautiful on account of the gloomy scenery passed to reach its borders—is so much like belonging to fairy land, that it is not strange that it should have been connected with sundry popular delusions. Some persons at first had affirmed, and others believed, that the lake had no bottom—or that it communicated with the neighboring ocean by a subterraneous passage. There was but slender ground for this delusion, as the lake is quite shallow, and the level of the bottom very regular. Mr. Mills Riddick sen. of Suffolk, told me that he assisted Commodore Barron in sounding across the lake. The depth about the middle, where greatest, was 15 feet. The bottom is of mud like the swamp, but sometimes a pure white sand covers the mud a foot, or perhaps more, in depth.

About the time that the lake was discovered, another event took place which produced ultimately the present proprietary state, and peculiar business and management of the swamp. This was the "taking up" by Gen. Washington, and a few other gentlemen acting upon his suggestion, of all the then unappropriated lands of the Dismal Swamp in Virginia. Before that time no persons had taken possession (by course of law,) of any lands, but those at and near the margin of the high land, because the interior lands were not deemed worth paying the lowest taxes on. Gen. Washington whose business as a land surveyor gave him many opportunities of acquiring possession of valuable public lands, and who obtained much of his wealth in that manner—saw a rich farm on the border, which had been rendered productive by being drained. Thinking that the whole swamp was equally available for cultivation, he formed the association above named, bought the farm in question, and took up all the remaining state lands, estimated then at 40,000 acres, but which are now supposed to be much more. They excluded the lake from their patent, though it was completely surrounded by their land, considering it not worth paying a tax for. By this ill judged economy the company has since suffered. When the Dismal Swamp Canal Company was afterwards chartered, they were granted by the commonwealth the exclusive use of the water of Lake Drummond to feed their canal—and this grant serves to shackle the efforts of the Land Company, (since also incorporated,) and would prevent the adoption of any general plan for draining. As is usually the case wtih corporations that come in contact, they seem more fond of squabbling with and opposing each other, than of uniting in any general procedure for the good of both.

The only objects of the Land Company at first were agricultural—and they commenced, and for years carried on tillage on their farm, and drainage to extend it. For the latter purpose, they dug a canal of some miles in length from the high land to the lake, which is still large enough for the passage of boats. This is now known as the "Wash-

ington Ditch". But whether their plans were judicious, or had the defects inherent in such joint stock companies, their labor and capital yielded little profit. The war soon followed, and before its end half their slaves went off to the enemy, as was generally the case in places so near their encampments. After peace was made, the work still went on badly, until the Company undertook the getting of juniper shingles. This business, which was not at first counted on, has since become their sole pursuit, and immensely profitable, and must continue profitable until the timber is mostly consumed, which indeed is rapidly approaching completion. The shares into which the stock was originally divided, have increased in price from $3000 each to more than $15,000; and the dividends made are large even for the highest price. But unlike most other stocks, this is diminishing in real value, with every year's waste of timber—and unless the land itself is made of value by drainage, the stock of this rich company will, at some future time, lose its market value, as rapidly, and to many owners as unexpectedly, as it was formerly acquired.

What I have stated of the Land Company, was learned from gentlemen who have been long and well acquainted with the general affairs of the company: but as their knowledge was not official, and rested on memory, facts may have been incorrectly stated as to dates, amounts, or other minor circumstances.

It had long been my intention to visit these scenes—but it was only very lately that a first and hasty visit was made, which has enabled me to judge of and to describe them, so far as will here appear.

On Nov. 17th. I reached Suffolk by way of the railway, from Portsmouth, which passes through a few miles of the swamp at its northern extremity, and thus permitted a first slight glance. It seems unfortunate that the first approach to the swamp, of almost every person hereafter, will be on the rapidly moving railway train. The savage gloom of the face of nature is altogether unsuited to the highly artificial facilities by means of which the traveller is flying past—and the discordance serves to lessen the high gratification which either the conveyance or the scene alone would cause, when new to the observer.

It was too late on that day to commence a voyage to the lake—nor could it be made on the next: for though every thing else necessary had been carefully provided, there were no good boatmen out of the swamp—and without those accustomed to the peculiar mode of navigating the canal, there was no getting on. The leisure afforded by these disappointments permitted me to visit some of the most interesting lands in the neighborhood—and to see some improvements on swamp lands, to which my remarks will now be confined. Having mounted on horseback, we returned, by a different route, to the swamp where it is crossed by the railway. This great public improvement had effected much of the first and heaviest labor necessary for draining the adjacent swamp lands, and had clearly indicated the proper mode to pursue—and the proprietor on one side, Mr. David Jordan, was making proper use of the opportunities thus offered. The swamp land here is 6 to 7 feet higher than the part of Suffolk which the railway passes over; and the ditches dug on each side, to drain and to raise the track of the road, furnish deep and wide discharging outlets, to receive the waters from all smaller ones draining from the swamp. This land had been filled or covered with water before the railway was begun: the ditches dug by Mr. Jordon, at right angles to the road, and emptying as above stated, have laid the land dry, and kept the water as much below the surface as the depth of his ditches, which is from 2 to 2½ feet. Still this is not enough for so spongy a soil, which will draw much moisture upward, and from considerable depths. I advised giving 10 or 12 inches more of depth to the smaller ditches, and still more to the large rail road ditch, which can be easily done. The water comes from the general overflowing or saturation of the swamp, and therefore a good large ditch ought to surround the whole piece designed to be reclaimed.

This tract of land was bought by Mr. Jordan and Mr. Benton, after the railway was made, at $7.50 the acre. Immediately adjoining, and also on the road, another body of land of 2000 acres had been bought before the road was commenced, for only $900—a most striking evidence of value thus increased. All the wood is now made marketable, and is cut to a great profit, and sent by the train to Portsmouth. It is cut (by the job) into 4 feet lengths, at 50 cents the cord—carted and corded along side the road for 25 cents more—(and this expense might be lessened one-half, by making branch wooden railways—) and the wood is sold at $1.25 in that situation, and now commands $4 if delivered in Porsmouth. As but little superintendence is required, the profit from an acre must be very considerable.

The swamp soil next the railway was from 1½ to 2 feet thick, resting on a good dark colored clay. The soil did not appear to vary materially in texture, as seen in the new ditches several hundred yards towards the interior. It is of the more firm and earthy kind, known as "gum swamp," but which seems to be composed in great measure of vegetable matter. It appears precisely like the soil of the gum and ash tide swamps on James River. Farther from the rail road, the ditch reached land which formerly had been burnt over, so as to destroy its trees, and it was now covered by the closest possible growth of reeds, among which were scattered many young pines. The soil did not seem to change, otherwise than by becoming deeper. The subsoil here is a stiff yellowish clay.

Early on the morning of Nov. 19, our party assembled at the northern end of the Land Company's Canal, about a mile from Suffolk. To this point all their shingles are brought by boats—and passed over to the tide creek close by, and which is about 20 feet lower in level, where they are received by vessels which carry them to the northern cities. Our party was mostly composed of gentlemen of Suffolk, who most kindly aided all my views and wishes. The boat was flat bottomed, long and spacious, belonging the Land Company, and designed solely for conveying passengers in trips to the lake, for pleasure or business. It was well suited for the purpose, and was well manned and provided for this occasion. The mode of propelling the boat is the same as is always used for the shingle boats. A strong pole is fastened across the square head, and another in like

manner at the stern, at right angles to the boat, the other ends extending across the tow-path on the margin of the canal. By these poles the men push the boat along in a rapid walk, and at the same time lean on them so as very much to lighten their labor. Four experienced hands accompanied our boat, who relieved each other from time to time. It seemed strange to me that horse power had not been substituted for that of man for this business; for though it would be costly to provide enough solid earth to make a tow-path for horses, when once done, one horse would pull as many boats as perhaps 15 or 20 men could shove.

This canal was dug 12 feet wide, 4 feet deep, and is 10 miles in length, and very nearly straight. Its water is almost a level—a gentle current flowing from the middle part towards each end. The firm land soon was passed through—(in which the banks are from 1 to 2, and for a short space 3 to 4 feet high—) and we then entered the swamp. The tow-path still continued to be a firm but low bank for a short space more—and then for the remaining 7 or 8 miles was scarcely above the surface of the adjoining swamp, and merely afforded better footing by being trodden, and thereby consolidated, and by the poles and other wood placed along where water covered the ground, for the boatsmen's steps. The earth thrown out in digging the canal must have made on each side a wide and high bank. But so little elevation now remains, that it furnishes alone sufficient proof of the correctness of my previous opinion, that such land, if kept dry, will rot away, leaving nothing but the very small portion of earthy matter in the soil. A permanent horse tow-path could therefore only be made by earth boated from the firm land, or by wood. Wooden roads for mules are made throughout the swamp, to convey the shingles to the borders of the canal, or lake—and these roads are so rough, and bad, that it seems as if as much power must be lost on them, as by using hand labor to propel the loaded boats. Some of these roads are 5 or 6 miles in length—and their united length must be very great. They are constructed as follows. Double lines of poles are laid in the direction of the road, about the distance apart of the cart wheels. Across these are laid split pieces, merely long enough for a single track of a cart, of 4 to 6 inches in diameter, and as angular and irregular as may be supposed, from mauling. These lie close to each other across the sleepers, and present a very rough and unstable surface for the wheels, and still worse for the feet of the mules. Still, I was told that on such roads, a mule will draw as heavy a load as an ordinary roads, on land. If so, it would seem that they would draw ten times as much on smooth longitudinal tracks, or such wooden rail, or tram-roads, as are described in Vol. I. of the Farmers' Register.

The escape of the water in numerous places over the margin of the canal, served to explain how there could be a regular current always setting towards the *closed* end of a level canal.

We soon reached juniper trees, (or white cedars) and the softest swamp soil, in which situation only these trees grow. I had never before seen a juniper—and should not now have distinguished them from the red or true cedars, but for their situation, greater height, and the beautiful straightness of their long naked trunks. The length of the branches, and the spreading and bulk of the whole top, bear but small proportion to the diameter and length of the trunks of the juniper. The trees are beautiful, and especially when they stand thick, forming a high roof of their evergreen tops, supported by numerous columns formed by their long and straight stems. They are not often large, or are too valuable as timber to be permitted to reach much size. Most of our whole course was through the "burnt woods," a large track of which nearly all the growing trees had been formerly killed and consumed by great fires in former times.

Though the form of the juniper is well adapted to stand on its soft and yielding foundation of mire, still when large it is easily overthrown by winds—and perhaps as many such were lying beneath the surface of the peat, as were standing erect. When thrown down, they are soon covered by water, and keeping wet, they never rot, except the sap wood, which is less than an inch thick. Much of the timber now got, is from trees long covered a foot or two deep under the surface soil, and which are found by the workmen by sounding, and then dug to and sawn off into shingle cuts, though half covered by water. Some of the great fires, in certain places, have brought to view and into use, more good timber than they injured, by burning the soil down to where numerous trees had lain perhaps for a century concealed, and their existence unsuspected. By the way—in digging down into the swamp, charcoal, the plain evidence of the former fires, and of the height at which the surface had then stood, is often found at several feet below the present surface—thus giving practical proof of the growth of the soil in thickness by the operation of the natural causes before reasoned from. But I get on slowly upon the canal.

The canal, when perfectly straight for a long course, with the trees on each side almost joining their branches across, presents a beautiful vista and perspective view—and with our singular boat and its equipage would have furnished a fine subject for a painter. Still more striking were the same scenes when we returned at night, with the bright light of our fire partially displacing the general darkness. The landscape painter would find many new subjects in this region, where every thing is strange and new—and so might the student of botany and other branches of natural history. A writer like Irving might here find enough interesting matter for description and narrative, to fill a volume. The land and the water—the vegetables and the wild animals—the inhabitants in their habits and occupations—are all as different from the surrounding country, as if the traveller had suddenly passed into a far remote region.

I landed several times in the course of the day, at places of different appearance and growth, and of different levels, and walked far enough to see the smamp in all its various conditions. The parts most easy to walk through (and these are scarcely passable) are where the original gigantic forest growth has not been destroyed or hurt by fire, or where the reeds, forming a thick growth, have all died, and thus permit one, with some effort, to break his way through such a brittle though close barricade. The getting of timber being con-

fined to the juniper trees, and these being of comparatively small size, the original grandeur of the forest is but little impaired by the labors of man. The cypress is here the king of the forest—and this, with the gums, and all other trees except juniper, are left untouched. The cypress grows on the same kind of land with the black gum—which, as before stated, is much firmer than the juniper lands. The farmers here, who have given any consideration to the subject, suppose that though the juniper land, if drained, would sink and soon fail, that the gum and cypress lands would be permanent. No doubt they would be *more* durable—but the vegetable matter that will *burn*, will also *rot*, if placed in circumstances favorable to fermentation: and soon or late, all the *excess* of vegetable matter in the soil, not combined with and fixed by the earths, and especially by calcareous earth, must rot away, and disappear.

We passed through sundry such changes of land, and of its vegetable cover, as have been described—but still a general uniformity of appearance prevailed, owing to the deep gloom and miry surface of the surrounding swamp, the sluggish and dark water of the canal, and its scarcely varying course. The only sign of life was seen at intervals in a "camp" of a pair of shingle-getters. Their houses, or shanties, are barely wide enough for five or six men to lie in, closely packed side by side—their heads to the back wall, and their feet stretched to the open front, close by a fire kept up through the night. The roof is sloping, to shed the rain, and where highest, not above four feet from the floor. Of the shavings made in smoothing the shingles, the thinnest make a bed for the laborers, and the balance form the only dry and solid foundation for their house, and their homestead, or working yard. Yet they live plentifully, and are pleased with their employment—and the main objection to it with their masters, (they being generally slaves,) and the community, is that the laborers have too much leisure time, and of course spend it improperly. Their heavy labors for the week are generally finished in five, and often in four days—and then the remainder of the week is spent out of the swamp, and given to idleness, and by many to drunkenness. All the work is done by tasks: and the employers have nothing to do except to pay for the labor executed. About 500 men are thus employed in the whole swamp, by the Land Company, and by numerous individual land owners. With all their exposure, the laborers are remarkably healthy, and almost entirely free from the autumnal fevers that so severely scourge all the surrounding country. It is said that no case has yet occurred of a shingle-getter dying of disease in the swamp—nor did my informants know that any one had been so sick as to require to be brought out. A young white woman lately died, whose father and his family have lived ten years in the swamp—but she had just returned from a visit of some length to the open country outside. It is well known that the borders of extensive peats in Britain are healthy, and in that respect are very different from the marshes of the same regions.

At length we came to another straight canal, (the old "Washington Ditch,") by entering which a slight deviation was made from our previous straight course. This turn obstructs the view, and thereby adds to the pleasure of the surprise that immediately follows. But a few yards more are traversed, when the boat passes, almost without warning of a change, from its narrow and shaded channel upon the wide-spread surface of the lake. The boatmen, having exchanged their poles for oars, rowed nearly two miles toward the centre of the lake. It is encompassed to its margin every where by a thick growth of tall trees, in which the cypresses, by their greater height and singularly formed summits, show most conspicuously. The general level horizon presented to the eye by the surrounding forest, is made lower and irregular in two large places on opposite sides of the lake, plainly indicating the wide and desolating passage of the last great fire, which left nothing alive in its track, nor any thing standing, except some of the largest trunks of trees, many of which still remain, though naked and scathed by fire to their summits. But so rapid is the growth on this swamp, that the burnt land is generally and closely covered by a young forest of considerable height, and among which are junipers of twelve inches through, which are already used for shingle timber.

It was a bright and clear day, and not a breath of wind was felt before emerging from the canal. But though there imperceptible, there was enough wind to ruffle the surface of the lake. The observer would at first suppose that the lake was in a great measure secured from the effect of wind, by its inland situation, and its close surrounding forest barrier. But high as is this barrier, it is low in comparison to the elevation of high lands in general—and the low level of all the adjacent country, and the vicinity of the Atlantic, permit to the winds such a sweep, that Lake Drummond is remarkably subject to their effects; and the violence of storms, is here about as commonly exhibited as on the sea.

The water, though clear and transparent, is so deeply colored by the extract of vegetable matter, as to seem black when seen in the lake and canals. When taken up in a glass, it is found that this deepness of color is delusive—and that it is about the color of pale rum or wine. It is every where through the swamp the same in quality, though not always as deeply tinged. It is, by some, considered medicinal, and is preferred for drinking by all the laborers and others most accustomed to its peculiar, and at first, disagreeable flavor, to any other water whatever. Some twenty-five years ago, invalids, and especially those suffering under pulmonary affections, were in the habit of visiting the swamp in the summer, to drink the swamp water for improvement of health; and they often remained for weeks together at a tavern on the Dismal Swamp Canal, beyond the opposite side of the lake.

The water in the lake, is now about 18 inches below the usual level, and of course we found the swamp so much the drier, and more accessible, near the borders of the lake. But notwithstanding this cause for the unusual dryness of the surface and notwithstanding also, the thick carpet of recently fallen leaves and other vegetable matter on the surface, sustaining the footsteps, I was continually reminded, by the yielding of the miry earth below, of the unsoundness of the support. Through the greater part of the year, the basin of the lake is full to the brim, and overflowing at many places into the surrounding swamp. The

water in the Land Company's canal through which we passed, however, was then kept at its ordinary height, by means of a wooden stop-gate placed across the mouth of the canal.

The fish of the lake are of species similar to those of the ponds and fresh water streams of the neighboring country—but of some, the sizes are much greater. The gar is sometimes seen above five feet long. Some kinds of the fish are highly valued, and dining on them is not the least enjoyment of the pleasure parties that often make excursions in summer to the lake.

Reeds, at remote intervals, bear seeds which have a considerable resemblance to wheat, and which will make tolerably good bread. These seeds are so seldom borne and are usually so few, that most persons do not know of their existence. Whenever a reed brings seed, it dies the same autumn. A few years ago was a general and great "reed mast," as a full bearing of seed is here called—and all the reeds consequently died at once. The present growth is in many places as thick and as beautiful as ever—varying however in height in different places, as if of different years' sowing, from 18 feet to 9 or less. But it seems as if nature demands a change of crops in this as in many other cases. I infer this from walking into large pieces of ground covered by a former growth of reeds, of which all had died in the last great mast season, and not a single living reed had followed, or was seen on such places. It is a vulgar error that the reeds bring seed once only in seven years. There are few more beautiful single plants than a reed of large size—and their general appearance is as pleasing when in smaller size they stand so thick as to form an almost impenetrable undergrowth.

It is known to most persons that bears still inhabit the Dismal Swamp, though long ago driven from every other part of lower and middle Virginia. But probably most have thought, as I did before this visit, that they were so rarely met with, that the killing of a single one would be a matter for great exultation, and cause of some notoriety to the huntsman who was so lucky. But I now learned that they were so numerous, that there were but few men who resided near the margin of the swamp who had not killed one or more. A young gentleman of our party, had shot several dozens of these beasts. He told me that the largest weighed, after being skinned and gutted, more than 500 pounds. They do not usually weigh half as much. It is difficult to raise many cattle or hogs on the adjacent farms, though the swamp furnishes such abundant food for both, owing to the slaughter committed on them by the bears. A bear will with ease kill a full grown cow, and has strength to drag away the carcass to a suitable hiding place. No dogs will hunt these animals to much purpose, and therefore it is not often attempted. The most numerous pack will seldom even bring them to bay, and will never attempt to seize on them. The bears are traced and found by the hunters, by listening for the noise of their nightly depredations in corn fields, or among live stock, or when breaking the limbs of the trees they climb in search of acorns or gum berries: or they are baited and killed by traps, or heavily loaded set muskets, the latter being a common and successful mode of destroying them. I heard related by the gentlemen of our party, and by the boatmen, sundry accounts of such adventures—and enough could easily be had to fill a second volume of Davy Crockett. Indeed, the story of one remarkable adventure which has been bestowed in print on Crockett, I believe, or if not, on some other western bear hunter, I found had been pilfered from the honors of an old borderer of the Dismal Swamp: for whether the story be true or false, (and it is fully believed here,) it had been told by the hero of it for forty years before his death.

Some more formal testimony of the great number of bears in the swamp was presented at the recent meeting of the Land Company, in a written proposal submitted to them by an individual for getting up their oak timber. This paper stated as a reason for their taking such measures, that the oaks were suffering, and many dying, under the effects of the depredations of the bears. This statement which would otherwise have been to me impossible to conceive a meaning for, was explained by the account received of the habits of these animals. Heavy and apparently clumsy as they are, they are expert climbers, and in that manner seek the gum berries and acorns, which, in their season, form a favorite part of their food. To reach the acorns on the extremities, they draw to them and break off the limbs, even when of large size—and into these broken places worms of a particular kind enter, or eggs are laid, as in the case of the pine bug, and in time the trees are killed by their borings.

A still more ferocious animal found here is the larger of two species of what are called *wild cats*. This name is certainly misapplied—but my acquaintance with this branch of natural history is not sufficient to enable me to fix the kind of either animal, from the descriptions given. The larger is brown, with a short tail, and is about as large as a middle sized or rather stout dog. The smaller kind is mole-colored, and has a long tail. Pole cats are also sometimes found in the borders of the swamp.

The most singular recent fact with respect to beasts of prey, is the appearance here of a solitary wolf a few years ago. As no wolf has been heard of east of the mountains for many years, the kind of this destructive animal was not suspected until long after he had been committing his ravages on the sheep about Suffolk—and more than a year passed before he was at last killed. His howling had often been heard by the inhabitants of that town, so near did he forage—but as his shelter in the swamp was perfectly secure from intrusion, and he moved out only by night, and as no dog would pursue him, it seemed long impossible to destroy him. He at last, like many warlike or predatory heroes, from Sampson down to Macheath, fell a prey to female attractions. Tired of celibacy, he was seeking a mate though of a different race—a bitch at a farm house: and her other suitors made so great an outcry over the foreign intruder, that his presence was discovered, and he was shot.

Upon inquiring for some one who had witnessed and was able to describe the great fire of 1806, the boatmen referred me to old Toby Fisher, who was then, as he still is, and has continued to be, a shingle-getter in the swamp. Accordingly, we visited Toby's camp—and his account was readily obtained. The first indication of the extent of the

fire was the uncommon prevalence of smoke, and its long continued increase. But a shift of wind would remove it from the neighborhood of the laborers, and for as much as a week together they were free from it. At last, the fire approached so near that the falling of the great trees was heard in rapid and continued succession, like the reports of guns heard at a distance—and when still nearer, bears and other "varmunts" were seen fleeing from destruction, and some times singed and lamed from having been forced through the fire. At last the laborers nearest the approaching flames were driven in, and in such alarm, that all hastily embarked on the lake, and left the swamp. From 30,000 to 50,000 shingles, ready for market, which were the wroperty of a single individual (the father of one of our party,) had been previously thrown into the old canal—but without obtaining much of the expected effect in saving them from the flames. The upper layers, above the water, having taken fire and been consumed, and their weight removed, the next layer would rise to the same height—and though wet, were soon dried enough, by so powerful a heat, to take fire also. Thus the shingles, which had been completely submerged, continued to rise and to burn, until but a small part was left. The fire continued about a month, and passed over the greatest part of the swamp. From other authority, I learned that the soil was in many of the dryest places burnt down as deep as two feet, producing such effects as have been already mentioned.

To such a fire, in former times, acting on a still dryer state of the swamp, it seems probable that the lake owes its existence, by the soil being burnt so low as to allow water to be retained, and of depth too great for plants to grow therein, which otherwise would have recommenced a growth of peat, and by it ultimately have filled again the void. That this vast basin was thus hollowed out by fire seems to be proved by stumps at the bottom being found charred on their surface—by the perpendicularity of the banks—and the operation is rendered probable, strange and great as the effect may be, by the reasonableness of its taking place, when the supposed existing circumstances are considered. I do not suppose that the basin was burnt to its present depth—and merely because it is not likely that the earth could have been dry to the depth of fifteen feet, or even of half that depth. But if burnt to three feet only, and then filled with water, the continued growth in thickness of the margin of the swamp generally, in the course of ages would raise the surface to fifteen feet above the present bottom of the lake.

But if the swamp soil is growing in thickness, and (as I suppose) the lake in depth, it is also believed, and with much appearance of truth, that the lake is likewise continually growing in superficial extent. That this is taking place along a large part of its margin, is evident to present observers, and still more to those who remember the state of things many years ago, and have witnessed the gradual encroachments of the water. Some however doubt whether other parts of the shore may not be growing, by filling up. I do not see why the water may not be spreading on all sides. The violence of the waves, in high winds, must undermine and wash away the banks—and of the earth thus removed, the lightest parts are dashed over upon the swamp, where they dry and rot, or otherwise add to the depth of the soil—and the more earthy and heavy, serve to raise the bottom of the lake, and the more so where nearest to the banks—and in this manner to cause the regular deepening towards the centre that is found to exist. Until the parts thus filled up shall rise near enough to the surface to support plants, and thus gradually grow to be high peat again, the lake must be widening on every side to which the waves are driven by violent winds.

The following results, showing the proportions of vegetable matter contained, were obtained by subjecting to trial different soils of the Dismal Swamp. The method used was to measure the bulk of each specimen, by pressing it moderately and equally into a measuring glass, marked at equal portions of an ounce of water each. The measured portions of earth were then separately exposed, in an iron vessel, to a strong heat, for one or two hours, until each seemed as much reduced by combustion as could be by such means. Coally matter still remained with all the ashes, showing that the burning was not completely finished. All these soils have been before described, either particularly, or generally. The amounts lost may be supposed to show the comparative proportions contained of vegetable matter.

1. Of the soil of the reed covered swamp land (Mr. Daniel Jordan's) described page 517, taken about 1½ or 2 feet from the surface, 3 parts (oz. measures,) lost in bulk, by burning, 2¼ parts, or 75 per cent.

2. Of the gum swamp soil, also Mr. Jordan's, described page 517, taken from 1 to 2 feet below the surface, (but quite free from any mixture of the clay subsoil—) 3 parts lost, by exposure to heat equal to any used, only half a part—or 16 per cent. This became black by burning, but could not be made to take fire, as the other specimens did. So small a loss was unlooked for.

3. Of the gum and cypress swamp soil near the north-western side of the lake. This was presumed to be some of the highest and firmest land, as it had been ditched and cultivated by old Draper in turnips, the best of which were as large as musket bullets, and had leaves 6 inches long. The specimen was free from unrotted vegetable matter. Five parts lost by burning 4½ parts, or 90 per cent.

4. Of juniper soil, taken from 6 to 10 inches below the surface, and below all living roots or unrotted vegetable matter. The specimen was a black slimy mud, which gave no indication to the eye of having an excessive proportion of vegetable matter. Eight parts (half a pint) of the soil after burning, left one third of a part—showing the vegetable matter destroyed by fire to be 96 per cent. This specimen and the next, only, burnt with flame for a short time.

5. Soil of gum and cypress, under its original growth—about 200 yards from the north-western side of the lake. The specimen taken from six to ten inches below the surface, and free from living roots, or unrotted vegetable matter. Eight parts (half a pint) was reduced by burning to one third of a part, or lost about 96 per cent. This specimen was burnt at a different time, and with more powerful heat than the others.

Before closing these remarks, some speculations will be submitted as to the feasibility and policy of draining this immense body of swamp, supposing

it permitted by the laws, and not opposed by any existing rights or interests.

In comparison with the magnitude of the object, it would seem to be both a cheap and certain operation to drain this whole body of land. All the water, except the rain that falls directly on its surface, it may be supposed flows from the streams coming in within the extent of some 10 or 15 miles of margin, from the highland on the western side. If a canal was dug through the western side of the swamp, its northern end emptying into the Shingle Yard Creek near Suffolk, and the southern end emptying into the head of Perquimans River, which rises in the swamp and flows southward into Albemarle Sound, this canal would divert from the swamp all the waters which now run in and continually flood it, and the level of the water would be sunk just as deep as the bottom of the canal might be made. Lake Drummond would be deprived of its supplying source, and would become dry, except the deepest central part. Nearly the same extent of land might be drained, and the same objects effected, by deepening the Land Company's canal, and giving it a northern outlet to tide water, and by opening another cut from the Perquimans into the lake, and both parts so deep as to lower the water 7 or 8 feet. Either of these modes however would destroy the navigation of the Dismal Swamp Canal, for which such a vast amount has been spent. But probably the water might be enough reduced to lay the land dry, without hurting the navigation, or materially diminishing the present extent of the surface of the lake. If lowering the water of the lake 5 feet only, would make the land dry enough, that reduction of level need not deprive the great canal of any of its present supply of water, because its feeder from the lake now has 5 feet of descent, and of course might be as much deepened at the highest end. But if the middle section of the canal, between its highest locks, could be deepened so much as to dispense with those locks, every difficulty would be removed, and the navigation would be greatly improved and facilitated in future use, and the general drainage be made far more perfect.

But there is a prior question of some importance. If a general plan of drainage is ever so cheap in execution, and certain in immediate results, would it be advantageous to so change the state of the swamp? The policy is at least doubtful, though the balance of advantages seem to be in favor of the drainage. An immense body of most fertile land would be brought into cultivation: but it would rapidly rot away, and while rotting, would probably be as unhealthy, as it now is remarkable for healthiness.

But every thing on the subject of draining large swamps, held by many different proprietors, in Virginia, is mere matter for theoretical reasoning and of useless speculation. Nothing can be done in practice, no matter how great the promised advantages, or the existing evils. The laws, indirectly, yet completely, forbid the making of any such improvements on a large scale: and still greater obstacles are presented in this case, where, in addition to the existence of separate rights of hundreds of individual proprietors, there would be the chartered and landed rights, and conflicting claims, of two great joint stock companies. Under these various circumstances, it may be safely predicted that the possible good or ill effects of a general plan of draining the Dismal Swamp will never be practically known—at least, not during the continuance of the present legal policy of Virginia.

PROPOSAL TO DRAIN THE DISMAL SWAMP.

By William Byrd of Westover.

Written more than a hundred years ago.

[It was after the preceding article on the Dismal Swamp had been written, and was partly in type, that we received and for the first time saw the manuscript from which the following article is printed, and also the full and minute journal of Col. Byrd, of the survey of the line between Virginia and North Carolina, which he superintended as one of the Commissioners of the Colony of Virginia. For the use of this antique paper, we are indebted to the owner, George E. Harrison Esq. of Brandon, and also for the original journal of his distinguished ancestor. This proposal, was founded on the information obtained by the survey, and recorded more fully in the journal—and upon these grounds and suggestions it is probable that the present Land Company was formed at a subsequent period, and in which Col. Byrd, or his son, was a partner, and his shares are still held by some of his descendants.

The journal (written in 1728) is interesting not only for its antiquity, but for the early views, and then supposed facts, which it presents. In our next No. will probably be inserted the portion of the journal embracing the passage, probably the earliest made by man, of the Dismal Swamp

The account of Col. Byrd given here, and in his journal, is erroneous as to several particulars which rested then merely on report, and therefore could not be more correctly known by him. For example, as to the supposed pestilential effects of the air—the total absence of animals—and as to the general width of the swamp, which he greatly underrated. It will be also observed, both from this piece and still more from his journal, that there was then no suspicion of the existence of the lake; and yet according to the maps of highest authority, its southern margin is within less than a mile of the state line, which was so long in being traced and marked by the surveying party which Col. Byrd in part directed and superintended.

The manuscript, in our charge, is the original, in the hand writing of the author—and though time-worn, and requiring much care to handle without injury, is perfectly legible. It is here copied literally.—Ed. Far. Reg.]

A Description of the Dismal.

The Dismal is a very large swamp or bogg, extending from north to south near 30 miles in length, and in breadth, from east to west, at a medium about ten miles. It lyes partly in Virginia, and partly in North Carolina. No less than 5 navigable rivers, besides creeks, rise out of it, whereof 2 run into Virginia, viz. the South Branch of Elizabeth, and the South Branch of Nansimond Rivers—and 3 into North Carolina,

namely, North River, North-west River, and Perquimonds. All these hide their heads, properly speaking, in the Dismal, there being no signs of them above ground. For this reason there must be plentifull subterranean stores of water to feed so many rivers, or else the soil is so replete with this element, draind from the higher land that surrounds it, that it can abundantly afford these supplys. This is most probable—because the ground of this swamp is a meer quagmire, trembleing under the feet of those that walk upon it, and every impression is instan ly filld with water. We coud run a long stick up to the head without resistance—and wherever a fire was made, so soon as the crust of leaves and trash burnt through, the coals sunk down into a hole, and were extinguisht. The skirts of the Dismal towards the east were overgrown with reeds ten or 12 feet high, interlaced every where with strong bamboe-bryers, in which the men's feet were perpetually intangled. Among these, grows here and there a cypress, or a white cedar, which last is commonly mistaken for the juniper. Towards the south end of it, is a very large tract of reeds, without any trees at all growing amongst them, which being constantly green, and waving in the wind, is called the *Green Sea.* In many parts, especially on the borders, grows an evergreen shrub very plentifully, that gos by the name of a gall-bush. It bears a berry which dyes a black colour, like the gall of an oak, from whence it borrows its name. Near the middle of the Dismal the trees grow much thicker—the cypresses as well as the cedars. These being always green, and loaded with very large tops, are much exposed to the winds, and easily blown down in this boggy place where the soil is soft, and consequently affords but slender hold for the roots, that shoot into it. By these the passage is in most places interrupted, they lying piled in heaps, and horsing on one another: nor is this all, for the snags left upon them point every way, and require the utmost caution to clamber over them. 'Tis remarquable that, towards the heart of this horrible desart, no beast or bird approaches, nor so much as an insect or a reptile. This must happen, not so much from the moisture of the soil, as from the everlasting shade occationd by the thick shrubbs and bushes, so that the friendly beams of the sun can never penetrate them to warm the earth. Nor indeed do any birds care to fly over it, any more than they are said to do over the lake Avernus, for fear of the noisome exhalations that rise from this vast body of dirt and nastiness. These noxious vapours infect the air round about, giving agues and other distempers to the neighbouring inhabitants. On the western border of the Dismal, is a pine swamp above a mile in breadth, great part of which is coverd with water knee-deep; however, the bottom is firm, and though the pines growing upon it are very tall, yet are they not easily blown down by the wind. So that the people waded through this part of it, without any other hindrance but what the depth of water gave them. With all these disadvantages the Dismal is in many places pleasant to the eye, though disagreeable to the other sences, because of the perpetual verdure, which makes every season look like the spring, and every month like May. This dreadfull swamp was ever judgd impassable, 'til the line divideing Virginia from North Carolina was carryd through it in the year 1728, by the order of his late majesty. Nor would it have been practicable then, but by the benefit of an exceeding dry season, as well as by the invincible vigour and industry of those that undertook it. Some of the neighbours have lost themselves here for some days, but never had either the courage or curiosity to advance very far. Nor can the difficultys of passing this inhospitable place be better conceivd, than by the long time that was spent in doing it, even by men who were not altogether without apprehentions of being starved—they being no less than ten whole days in pushing on the line 15 miles, tho' they proceeded with all possible diligence and resolution, and besides, had no disaster to retard them.

Advantages of Draining the Dismal.

The foregoing being a true and faithful account of the present condition of the Dismal, if any way coud be found to drain it, the benefits both to his majesty and these colonys, would be very considerable.

1. First, that vast extent of bogg, which is now of no value to the crown, nor ever can be, in the condition it lyes at present, will come in time to pay the same quit-rent that other lands pay in this colony, and employ a great number of people.

2. By draining the Dismal, it will make all the adjacent country much more wholesome, and, consequently, preserve the lives of many of the king's subjects; this will happen by correcting and purifying the air, which is now infected by the malignant vapours rising continually from that large tract of mire and filthiness.

3. After the Dismal comes to be drained, it will be the fittest soil in the world for producing of hemp: the propagating of which, is with so much reason desired and encouraged in his majesty's plantations. Besides, the hemp made in this place will have the advantage of being nearer to navigation than it can commonly be in this colony.

4. As the Dismal must be draind by the help of canals, to be cut from the northern to the southern rivers, there will be a safe and easy communication, by water, betwixt Virginia and North Carolina, to the manifest advantage of both. Virginia will have the benefit of being the port and public mart, to which the inhabitants of North Carolina must bring their commoditys; and these, again, will have the convenience of shipping the effects of their industry, and receiving their returns from Great Britain, in good ships—there being no inlets into the hither part of that province, but what are dangerous even to the small vessels that can enter them.

Conditions of Draining the Dismal.

The Dismal then being so utterly useless to the crown, and such a nusance to the neighbouring country, and the advantages of draining it being so many, there remains no difficulty but to find out a method of doing it without leading his majesty into an expence, or laying a burthen on the people; and I humbly conceive that neither of these objections can be raised against the following scheme.

It is therefore proposed that his majesty be graciously pleasd to grant the Dismal, and all the land

not yet taken up, lying within half a mile of any part of it, to the petitioners hereafter named; and the better to encourage them to undergo the heavy charge of draining it, 'tis farther proposed, that the said petitioners may have such grant, free from rights, and be also exempt from paying any quit-rent, for the space of 50 years, except one pound of hemp yearly, on St. George's day.

It is also proposed, that all the persons employed in draining the said Dismal shall be excused from paying any levys for the space of ten years after the date of the said grant.

Nor can it fairly be objected, that such exemption from rights and quit-rents will be any loss to the crown, because nobody will ever take up any land in the Dismal, but with intent to drain it—and the expence of that will be too great to undertake it without this encouragement at least. Wherefore, since the king can get nothing for it as it now is, it woud be more to his majesty's interest to grant it on the prospect of a future advantage, than to let it lye wast, and continue a nusance to perpetuity. Nor woud the country be a looser by indulging the undertakers of this great work with a freedom from levys, because of the advantages that woud happen to it from their industry—and because most of the hands employed therein, will be imported on purpose to carry on this laudable design, and consequently woud never pay any levys without it.

And to remove all suspicion of fraud, it is likewise proposed that a condition be inserted in the royal grant, that in case the petitioners shall not drain the said Dismal in the space of ten years, they shall then be obliged to pay all arrears of quit-rent from the date of the said grant, together with the full value of the rights which ought otherwise to have been payed down in the beginning, proportionably to the quantity of land so granted. The petitioners humbly relying on his majesty's goodness, to indulge them a longer time in case unforeseen difficulty shoud require it.*

Proposals for Draining the Dismal.

If this great undertakeing be managed prudently, it may be completed in the forementioned time of ten years, for the summ of four thousand pound sterling, and perhaps for a great deal less.

It is therefore proposed, that this summ be divided into 20 shares, and they to be subscribd by as few persons as possible. That the Earl of Orkney, Sir Charles Wager, Sir Jacob Acworth, and Col. Bladen be invited to encourage this subscription, being well wishers to these colonys, as well as to the propagateing of hemp in his majesty's plantations, and the rather because their credit may be necessary in obtaining the royal grant. So soon as such grant shall be obtaind, the first step ought to be to procure a man that perfectly understands draining of land, at a moderate salary, and while that is transacting in England, the whole tract should be exactly surveyd here, and the levil of it tryd. After that, a proper piece of land shoud be chosen on the skirts of the Dismal, whereon to make the first settlement. Sufficient land may be found out there that may be laid dry by a trench only, and with that improvement done, produce hemp and rice, as well as Indian corn.

The next advance must be to build convenient houses to receive the people necessary to be employd in the beginning, and to provide the proper tools, bedding, cloaths, and provisions for them. When these are all ready, let 10 seasoned negros be purchased, of both sexes, that their breed may supply the loss. Let these be employd in clearing and in trenching the ground, in makeing of corn and other requisite improvements.

In the mean time, a moderate stock of cattle should be provided, which will winter on the edges of the Dismal with very little dry feeding.

It may be proper to teach two or more of your negro men to saw, make shingles, burn tar, draw clap-boards, and set up tight casks, that so all the timber cut down to clear the ground, may be turnd to the best advantage. And the mony to be raisd from all these improvements will help to defray the expences of the first settlement, and in some measure enable the work to carry on itself; that so the mony remaining in bank may be reservd for the purchase of negros, as fast as room can be made for them, and your work shall need a greater number of hands to carry it on with vigour.

When you have thus got a firm footing, a near computation may be made what increase of strength will be wanting the second year—remembering to purchase no more negros than you have made provision for, and there is no doubt in the world, but by the time the whole mony is expended, the Dismal will be made as good land as as any in the country, with at least 300 negros working upon it, and stockt with an incredible number of cattle. From all which we may safely conclude, that each share will then be worth more than ten times the value of the original subscription, besides the unspeakable benefit it will prove to the publick.

An Estimate of the First Expence.

To the building a quarter, barn, and house for an overseer,	£ 60 00 0
To the purchase of 10 seasond negros, half men, half women,	300 00 0
To cloaths, bedding, tools, and provisions for the first year,	40 00 0
To 20 cows and calves, 9 steers, one bull, and a horse,	50 00 0
To the wages of an overseer, and his provisions,	25 00 0
To accidents and charges unforeseen,	25 00 0
To soliciting the grant in England,	50 00 0
To surveying the Dismal, and the expence of the patent here,	50 00 0
	£600 00 0
To 20 negros the 2d year,	400 00 0
To 25 negros the 3d year,	500 00 0
To 25 negros the 4th year,	500 00 0
To 25 negros the 5th year,	500 00 0
To 25 negros the 6th year,	500 00 0
To 25 negros the 7th year,	500 00 0
To 25 negros the 8th year,	500 00 0
	£4000 00 0

The foregoing account shows only how many

*This paragraph, in the manuscript, is marked across, by a single stroke of the pen.—Ed.

negros may be purchased for £4000, being the summ subscribed, to be employd in the Dismal; but besides that mony, there is no question but the profits ariseing from the labour of the negros on the land, which will every year be laid dry, will be very considerable—insomuch that it will not only defray all incident charges, but also purchase many more people to finish this great work. And for those which happen to dye, 'tis probable that their place will be fully supplyd by their children, if care be taken to buy as many women as men. And because it will be some years before such children grow up to a stature fit to work, it will be prudent to lay out part of the mony in boys and girls, which will not only season better than men and women, but will be very soon fit for labour, and supply the mortality that must happen among so great a number. Besides the advantages of propagation, there is another benefit in provideing wives for the men: it will keep them at home, and prevent their rambling abroad anights, from which arise many great inconveniences. By this practice they learn to be dishonest, take cold, and lose their rest, whereby they are less fit to do their work the following day. Besides, when they have wives in other familys, they are frequently poisoned by the jealousy of their rivals, who think they have a much better right to the affections of their fellow servants, than any stranger. By this many lose their lives.

[COPY OF PETITION ANNEXED.]

To the King's most Excellent Majesty,

The petition of

Humbly sheweth:

That whereas there is a large bogg, situated partly in Virginia, and partly in North Carolina, which lyes wast by reason of the mire and water with which it is covered, and corrupts the air of all the neighbouring country by the noxious vapours that perpetually ascend from it, to the great annoyance of your majesty's subjects: and whereas, many considerable advantages woud arise, both to your majesty and those colonys, from the effectual draining of it, which cannot be performed without a very great labor and expence—

Your petitioners therefore humbly pray, that your majesty will be graciously pleasd to grant to your petitioners the said bogg, and all the land not yet taken up, lying within half a mile of any part of it: and the better to enable them to support the heavy charge of draining it, your petitioners further pray, that your majesty will please to grant them the said bogg, free from rights, and also exempt them from paying any quit-rent for the space of 50 years, except one pound of hemp to be paid yearly.

And your petitioners shall ever pray, &c.

For the Farmers' Register.

HASTY OBSERVATIONS ON THE AGRICULTURE OF THE COUNTY OF NANSEMOND.

By the Editor.

The county of Nansemond, exclusive of the considerable portion embraced in the Dismal Swamp, and other smaller swamps and tide-marshes, is generally of sandy, and naturally poor soil, moderately high and undulating on and very near Nansemond River and the tributary streams, and very level in the larger remaining part of the county. The smaller portion of river lands, and the larger body of the back lands, or "piney woods," as called in distinction from the river lands, are very different in several important respects, besides that of the nature of the soil.

From the very short and limited opportunity which I had for making observations on the agriculture of Nansemond, it seemed, with a few exceptions of spirited and profitable improvements, to be in a very low state: lower indeed, considering the great natural resources for making profitable improvements of the soil, and products from its cultivation, than any other part of Virginia, that I have yet seen. It is reported, however, that there is a still more rude and degraded state of agriculture, a still greater neglect of the advantages offered by the soil and its locality, in the adjacent counties of Norfolk and Princess Anne: as if the more that nature offers to man of her bounties, the less he is disposed to avail of their benefits, or indeed of any portion of them in a proper and profitable manner. It is indeed passing strange—and not sufficiently explained by all the reasons stated, that the country immediately surrounding the oldest, and long the most important commercial town in Virginia—having every advantage of markets—with much productive soil, and the most abundant resources for enriching the balance—with waters offering nearly as rich products as the lands—and in addition, with the long continued, and long to be continued annual expenditure of vast sums from the national treasury on the great public works in this region—that notwithstanding all these and other advantages, that this oldest settled and longest cultivated part of Virginia, and of the United States, should be now the least removed from the wild state of nature, that the inhabitants generally seem to be losing, rather than gaining, in the general progress of improvement, knowledge, and refinement. If, in addition, the mania for emigration to the west should rage hereabout as it is doing in the middle region of Virginia, the time may come when the howling of wolves will be heard from the suburbs of Norfolk.

The most general rotation of crops in Nansemond, (if any deserve the name of rotation,) is 1st, Indian corn, 2nd, grazing—and so on, as long as the land will bring a crop that will pay half the cost of tillage. A still more scourging course is not unfrequent, which is corn every year, as long as the land can bear it, or until the more extended clearings of the cultivator permit him to adopt the improvement of the two-shift rotation above described, and to let his fields have "rest" every other year, under the close grazing of such natural herbage as may attempt to grow. Upon the naturally high fertile shelly lands on Nansemond River, almost continual tillage under corn, as a matter of choice, for many years together, and with little or no manure, was the general practice: and such was the astonishing durability of the lands, that to the last they gave pretty good crops, and exhibited evidences of great power of resuscitation in the soil, if allowed any chance by proper resting, or putrescent manure. On the poor back

lands, where under corn every year, field peas are also raised in every intermediate row. Of these but part are gathered for seed, sale, or home consumption, and the hogs are turned in to eat the balance, as soon as the corn is fit to be gathered. This mixture of the pea crop is general, and in some measure mitigates the severity of both the two-shift and one-shift rotations. But this kind of cultivation is by no means confined to this county. It has been very general through lower Virginia, and is still to be found in nearly all the lower counties. Nor is the improvement of soil less frequent in Nansemond than in some other of these counties—it is only the more remarkable and condemnable there, because the marl and other manures in that county offer such abundant means for improving the soil and increasing the products. In travelling on the railway, from Portsmouth to Roanoke, I saw not an acre of the numerous and extensive cornfields that seemed to have produced more than 15 bushels—and much the greater part would not have averaged more than 10 bushels. It is true, that the manured spots and best grounds were generally in cotton—but even of these, very few fields, if any, would have brought 20 bushels of corn to the acre. I do not estimate the cost of tillage (at least in Virginia,) half as high as does the editor of the *Cultivator*, who has stated that 30 bushels of corn per acre is the smallest crop that will give any profit to the farmer: but nevertheless, I think that not half of all the fields seen on this route can leave any clear profit on the cultivation.

In Nansemond River are caught immense quantities of fine oysters—and the Indian banks of shells all along the river, furnish testimony that the river has for ages yielded, in abundance this valuable product. On every elevated point on the river, and indeed generally along its banks on both sides, are found spread the prodigious deposites of decayed oyster shells which give the high and well deserved reputation to these lands for fertility, and durability of productiveness under long continued grain tillage of the most scourging kind. I could not learn any certain facts as to the exact length of time during which any particular shelly field had been kept in corn, without rest or manure, and what was its rate of productiveness after such hard treatment. But I found existing a general belief that but few of such lands had escaped 20 or more years of such continued cropping—and on some, the cultivation for 200 years has been never lighter than the two-shift rotation above mentioned, with no more manure than the proprietor could scarcely help making. After all such treatment, these lands, however greatly reduced from their first exuberant fertility, were still what was deemed good and productive soil—and yielding crops that would have given the character of *rich* to any land producing such, in the south-eastern counties, away from tide water.

Having no leisure for more extended observations, I visited only Stockley, the farm and residence of Wills Cowper, Esq. which was the site of the principal town of the Nansemond tribe of Indians, and of whose separate huts, the ground still affords testimony of the localities, in the greater abundance of the shells, swelling above the general level at each spot where the surface had not been moved, otherwise than by ordinary tillage. Just opposite in the river is Duplin (now called Dumplin) Island, the former residence of the kings of the Nansemond tribe of Indians. This island contains about 14 acres of high lands, and a considerable body of marsh.*

* This island, and the western shore, on which stood the Indian town, and the abundant product of the large corn fields thereon, are mentioned in the following passage in Smith's History of Virginia. The incidents occurred in Sept. 1608, during Captain Smith's second expedition of discovery of the waters of Chesapeake Bay—in which adventure he was accompanied by 12 men only. See *Trve Travels, Adventures*, &c. ch. vi.

"In a fayre calme, rowing towards Poynt Comfort, we anchored in Gosnolls Bay, but such a suddaine gust surprised vs in the night with thunder and rayne, that we never thought more to haue seene Iames Towne. Yet running before the wind, we sometimes saw the land by the flashes of fire from heaven, by which light onely we kept from the splitting shore, vntil it pleased God in that blacke darknesse to preserue vs by that light to finde Poynt Comfort: there refreshing ourselues, because we had onely but heard of the Chisapeacks and Nandsimunds, we thought it as fit to know all our neighbours neare home, as so many nations abroad.

So setting sayle for the southerne shore, we sayled vp a narrow riuer vp the country of Chisapeack;* it hath a good channell, but many shoules about the entrance. By that we had sayled six or seaven myles, we saw two or three little garden plots with their houses, the shores overgrown with the greatest pyne and firre trees we ever saw in the country. But not seeing nor hearing any people, and the riuer very narrow, we returned to the great riuer, to see if we could finde any of them. Coasting the shore towards Nandsamund, which is most oyster-banks; at the mouth of that riuer, we espied six or seauen salvages making their wires, who presently fled: ashore we went, and where they wrought we threw diuers toyes, and so departed. Farre we were not gone ere they came againe, and began to sing, and daunce, and recall vs: and thus we began our first acquaintance. At last one of them desired vs to goe to his house vp that riuer; into our boat voluntarily he came, the rest ran after vs by the shore with all shew of loue that could be. Seauen or eight myles we sayled vp this narrow riuer: at last on the westerne shore we saw large cornfields, in the midst a little isle, and in it was abundance of corne; the people he told vs were all a hunting, but in the isle was his house, to which he inuited vs with much kindnesse: to him, his wife, and children, we gaue such things as they seeme much contented them. The others being come, desired vs also to goe but a little higher to see their houses: here our host left vs, the rest rowed by vs in a canow, till we were so far past the isle the riuer became very narrow. Here we desired some of them to come aboard vs, whereat pausing a little, they told vs they would but fetch their bowes and arrowes and goe all with vs, but being a shore and thus armed, they perswaded vs to goe forward, but we could neither perswade them into their canow nor into our boat. This gaue vs cause to prouide for the worst. Farre we went not ere seauen or eight canowes full of men armed appeared following vs, staying to see the conclusion. Presently from each side the riuer came arrowes so fast as two or taree hundred could shoot them, whereat we returned to get the open. They in the canowes let fly also as fast, but amongst them we bestowed so many shot, the most of them leaped overboard and swam ashore, but two or three escaped by rowing, being against their playnes: our muskets they found shot further than their bowes, for wee made not twenty shot ere they all retyred behind the next trees. Being thus got out of their trap, we seised on

* Now Elizabeth River.—Ed.

These collections of shells, all along the river, are from 2 to 3 feet deep nearest the river banks, and spread back, covering the whole surface, and gradually thinning, so as to form a large portion of all the fields on both sides of the Nansemond: and these original artificial deposites make the celebrated fertile shelly lands. It is but within a few years back that Mr. Cowper and a few others have greatly extended the surface of this kind of soil, by digging down some of the thickest parts of the bed, and carrying the shells, and the rich black earth with which they are always intermixed, to other lands, for manure. This is giving, at the same time, both calcareous and putrescent (or alimentary) manures—and the efforts have been as good as might have been anticipated from such applications, where both kinds of manure were wanting.

It was this shelly soil, and others similar elsewhere, though but little known by personal examination, that furnished to me long ago one of the strongest and earliest proofs of the value and manner of operation of calcareous manures. In investigating the subject at a later period, I obtained from Mr. Cowper specimens of the soil now first seen by me—all of which showed a remarkably large proportion of calcareous matter, though most of it (fortunately) is still in the state of coarse shells, or their fragments. The following statement of the composition of one of them, from the *Essay on Calcareous Manures*, (p. 20, 2nd Ed.) will serve as a specimen of some of the best soil of the Indian Banks.

"Oyster shell soil of the best quality from the farm of Wills Cowper, Esq. on Nansemond River—never manured, and supposed to have been cultivated in corn as often as three years in four, since the first settlement of the country—now yields (by actual measurement) thirty bushels of corn to the acre—but is very unproductive in wheat. A specimen was taken from the surface to the depth of six inches, weighing altogether

242 dwt., which consisted of

126 — of shells and their fragments, separated by the sieve,
116 — remaining finely divided soil.

Of the finely divided part, 500 grains consisted of
18 grains of carbonate of lime,
330 — silicious sand—none very coarse,
94 — impalpable aluminous and silicious earth,
35 — putrescent vegetable matter—none coarse or unrotted,
23 — loss.

500"

I refrain from stating more particulars of these interesting and valuable shelly lands, because it has been promised that better information on this general subject, and more full details, shall be furnished from a highly respectable source. It is enough here to say that the value of the Indian shell banks as manure, as well as of the marl found in various places, have been used to great advantage on Stockley, as well as on some other river farms.

Wheat is scarcely grown at all in Nansemond, and the shell lands are decidedly unfavorable to that crop, but very friendly to clover—though this grass has but lately been tried, or even supposed capable of being here made. On clover on this shell land, Mr. C. had tried gypsum without any profitable effect. This result is very different from what I had counted on. But there was also another difference in result—and one may serve to explain the strangeness of the other. Though perfectly satisfied that lime in soil, is essential to the sure and profitable growth of clover—and that shells or marl will insure its healthy growth on even sandy and poor land—I had not learned from experience, that calcareous manure alone would sustain *luxuriant* clover, on a sandy soil, even when aided by putrescent manure: though supplying gypsum in such cases, another necessary or specific manure for clover, will generally produce a heavy crop of this grass. But this made by Mr. C. was a very heavy and luxuriant crop, without gypsum—and was no better where it was applied. I infer that nature had somehow supplied the soil with gypsum in sufficient quantity—which supposition will serve to explain all the results.

The farms on the banks of Nansemond River are in every respect, save one, most desirable as places of residence, as well as for agricultural profit. That exception is their being very subject to the only disease that has peculiar or much power in lower Virginia—autumnal fevers, the effects of malaria. I am loath to believe the cause of these diseases to be beyond human control. It is not probable that the neighboring salt marshes are the source of this evil, because in other parts of lower Virginia, in the neighborhood of other marshes apparently precisely similar, the country is comparatively healthy. So far as malaria emanates from the dry land, (as no doubt it does wherever circumstances are favorable to its formation,) there is little doubt but that this source may be closed up by the general and sufficient application of marl, or other calcareous manures. The great

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all their canowes, and moored them in the midst of the open. More than an hundred arrowes stucke in our targets, and about the boat, yet none hurt, onely Anthony Bagnall was shot in his hat, and another in his sleeue. But seeing their multitudes, and suspecting as it was, that both the Nandsamunds and the Chisapeacks were together, we thought it best to ryde by their canowes a while, to bethink if it were better to burne all in the isle, or draw them to composition, till we were prouided to take all they had, which was sufficient to feed all our colony: but to burne the isle at night it was concluded. In the interim we began to cut in peeces their canowes, and they presently to lay downe their bowes, making signes of peace: peace we told them we would accept it, would they bring vs their kings bowes and arrowes, with a chayne of pearle; and when we came againe giue vs foure hundred baskets of full corne, otherwise we would breake all their boats, and burne their houses, and corne, and all they had. To performe all this, they alleged onely the want of a canow; so we put one a drift and bad them swim to fetch her: and till they performed their promise, wee would but onely breake their canowes. They cryed to us to doe no more, all should be as we would: which presently they performed, away went their bowes and arrowes, and tagge and ragge came with their baskets: so much as we could carry we tooke, and so departing good friends, we returned to Iames Towne, where we safely arrived the 7. of September, 1608."

sources of autumnal diseases in lower and middle Virginia, is more likely to be found in the mill ponds—and these are abundant along, at least, part of the sickly borders of this river. If the meeting of salt and fresh water is a fruitful source of malaria, or the spreading of salt water over fresh marshes, (as stated in an article in the last number of the Farmer's Register,) then the discharge of floods of accumulated water, after heavy rains from these mill-ponds, may, by overflowing the adjacent salt marshes. produce much of these deplorable results, in addition to the universal extrication of malaria from the ponds themselves, when lowered by summer droughts. The pestilential emanations thus produced from mill-ponds, and from the discharge of their floods upon salt marshes, may thus serve to produce much the greater part of the autumnal diseases so prevalent on the banks of this river. The remedy for this great evil will only be found in the general abatement of the greatest physical nuisance in our country, viz. mill-ponds on small or insufficient streams. As to the smaller amount of such disease justly attributable to emanations from the general face of the country, it would be greatly limited, if not annihilated, by that kind of manuring which would most redound to the profit of the farmers, in other respects as well as in preserving health. Such has been the undoubted result on farms and in neighborhoods in Prince George, where marl has been extensively applied. But it is evident, that to derive this benefit fully, all the lands of the neighborhood, whether in wood, meadow or arable, should be made calcareous on the surface.

The salt marshes in this neighborhood are generally high and firm, and rarely covered by tides. The growth is of different kinds of salt grasses, which are excellent food for cattle in the spring, and beginning of summer, but which become unfit afterwards. If this is (as is alleged) from the older state of the grasses, it might be prevented by mowing the marshes, and thus providing a young and tender growth in the latter part of summer. The kinds of grass which grow on these marshes affect that locality more because of its saltness than its wetness. As a proof of this, I saw the same kind of grass, of good growth, covering the lofty ramparts of the fortress at Old Point Comfort, though the marsh mud which had been used to construct them, had been for years in this very dry situation.

Marl has not been in use but a few years in Nansemond county, nor is it now used to much extent, or by many persons, compared to the great number who have it in their power to profit well by this manure. I saw, as well as heard of, striking improvements made by marling, on the farms of Mr. J. T. Kilby, Mr. Mills Riddick, sen. and Mr. J. Bunch, all in the neighborhood of Suffolk. But still, the example of these gentlemen has had but little effect in stimulating, or even awakening their torpid countymen. Some persons went zealously, but not judiciously to work: they put rich marl on poor land in quantities far too heavy; and having thereby injured their land, they have taken no means to correct the error. They are content to abandon marling, and to stand by their first fruits of it, as full evidence of its worthlessness, or the danger of using it.

This county is celebrated for its crops of very fine sweet potatoes; and on some of the lower river lands, water-melons are a considerable and very profitable field crop. They are sent by vessel loads to the northern cities. For such distant markets, they are gathered before they are quite ripe, and therefore never can be of as fine flavor as when left to ripen on the vines. The greater part of the sweet potatoes are sent to the northern markets.

The former owners of farms on Nansemond River have generally lived in the exercise of what has been so much lauded as "old Virginia hospitality"—and which deserves more to be reprobated, as the system or habits that have tended more than any thing else to ruin the estates and their owners, or their children, throughout lower Virginia. I speak not in condemnation of true hospitality, but of its excess and abuse. According to the long established precedents in such cases, few of the lands on the Nansemond, are now held by the children of former possessors—and still fewer by the same individuals who held them twenty years ago. A contrast to this state of things is exhibited by the people who cultivate the poor lands of the "piney woods." Deprived of all the comforts and luxuries furnished by the river, and compelled by the difficulties of their situation to be laborious and frugal, they have prospered in their estates, in spite of poor lands and a wretched system of agriculture, as much as their richer and more favored countymen have done otherwise. They live plainly, but comfortably, have no fear of the sheriff before their eyes, nor anticipations of leaving their children in want, or dependence—and are able to exercise, and doubtless do exercise, true and kind hospitality, without ostentation, and without the waste of the entertainers' time and good habits, still more than of his victuals and drink, on idle loungers and dissipated companions and visiters.

It was stated in the early part of these remarks that the low state of agriculture in this and the counties lying to the east, was inexplicable. But the reasons given for it will serve as a partial explanation. The main one is the inducements held out to capitalists, and still more to poor men and laborers, to get timber for market, rather than to till the earth for slower-coming gains. The immense quantity of excellent timber in these counties has afforded occupation, in getting it up for market, to any amount of labor: and the northern demand for shingles, and that of the navy yard in Portsmouth, and the works at Fortress Monroe, for every other kind of building and ship timber, have offered ready and profitable markets for all the products of labor thus directed. Even though the general and average returns of this and agricultural labor had been equal, the latter would be received only after a year's time (at shortest,) while a load of timber could be cut and sold in a few weeks. But the profits of the timber business were the best. Besides—the great public works long carrying on at the navy yard and the fortifications required a great number of ordinary hands, for which enormous hires have been always paid. This served to take away from agricultural labor much of its proper laboring force—and induced the owners of labor and capital to look to other sources of profit than cultivating or improving the soil. These advantages, have had evil, instead of good effects.

THE PEAT SOILS OF SCOTLAND, COMPARED WITH THE JUNIPER SOIL OF THE DISMAL SWAMP.

[The writer of the following answer, though in the humble station of overseer of a farm, is an intelligent and well read agriculturist as well as a hard working and practical one. Supposing that he must be, from personal observation, well acquainted with the peats and peat soils of his native country, Scotland, and therefore could correctly judge of the points of difference or of agreement between them and the soil of the Dismal Swamp, a large unbroken specimen was sent to him for that purpose, of the juniper soil, including both super and sub-stratum, and also the cover of plants found growing thereon. It was from the sub-stratum of this parcel that the specimen No. 4, was taken, which was stated at page 520, to lose 96 per cent. in bulk of vegetable matter, by burning.—Ed]

To the Editor of the Farmers' Register.

Coggin's Point, December 4th, 1836.

I have examined the specimen of soil from the Dismal Swamp, which you sent to me, and shall endeavor to point out the very close resemblance which it bears to the peat soils of Scotland. To make myself more easily understood, I shall describe the different varieties of peats, or peat soils, as they occur in Scotland, founded upon the practical uses made of them, and the different degrees of decomposition in which the vegetable matter is generally found.

The first kind is the solid true peat, or turf, a mass of decayed vegetable matter, sufficiently firm to cut easily with the spade into pieces, of the size and shape of common bricks, or larger, and which, when sun-dried, are ready for fuel. This solid mass often occurs of very considerable depth. I have often seen it upwards of four feet deep.

The second kind is a similar mass of vegetable matter, only in a state of greater decomposition, and after being dug out, requires to be baked or compressed with the hand into small cakes called "peat pies," before they are laid out to dry for fuel.

The third is the more perfectly decayed vegetable matter, entirely unfit for fuel; this generally underlies the two former, and often occurs of very great depths. In most of the peat mosses, (swamps,) it is in nearly a fluid state—and a person walking on the comparatively firm surface, even in dry seasons, will cause the earth around him for a considerable distance, to vibrate at every step. This, very nearly pure vegetable matter when deprived of its superabundant water, is frequently used in a compost with lime as a top-dressing on pasture fields, and is also much used in composts by nurserymen and horticulturists in raising many plants, particularly heath from the south of Africa, and many plants from this country, such as kalmias, azaleas, rododendrons, &c.; some deposites of this contain a considerable portion of ferruginous matter.

This specimen of soil from the Dismal Swamp resembles all the kinds in color, but can hardly be said to present any other resemblance to the first. Decomposition in this country, I presume, takes place too rapidly to admit of such a formation. But all of the specimen of surface soil (about six inches deep,) above the slimy mud, presents a very close, if not identical resemblance to the second kind above described, and in Scotland, would be termed peat earth. In burning, it presents the very same appearances, and emits while burning the same strong, but not disagreeable smell—a smell distinct from that of any other among vegetable matter with which I am acquainted, and which adheres tenaciously to every thing with which it comes in contact. When used as a fuel in the distillation of spirits, it imparts to the spirits the same peculiar flavor, and it is generally much esteemed.

The specimens of cryptogamous plants accompanying the soil, particularly the mosses (*Musci*) are the same, or at farthest, only different varieties of the same species, as are indigenous to every peat moss in Scotland. In the specimen of these were a few dried leaves of fern, (*filices,*) and which from its appearance, I judge to be the nephrodium lobatum, which though not growing extensively in the peat mosses of Scotland, is to be found in the neighborhood of springs in sheltered situations on soils of this nature. In wet and swampy situations in this country, I have seen many plants of the sweet gale (*myrica gali*) growing, and which also are plentiful on some of the peat soils of Scotland—with this difference, that in this country they are indeciduous, in Scotland they are deciduous; and I presume, the same plant abounds in the Dismal Swamp.

The masses of vegetable matter in the peat mosses of Scotland consist principally of a great variety of mosses—a few only of the fern tribe, which require more silex for their growth than is generally to be found in the real peat mosses—large quantities of coarse grasses also abound, these decaying more rapidly than the other species of plants, appear to form the principal earthy ingredient found in the true peat. The heath which principally abounds in such situations, is the *erica vulgaris*. Altogether these peat mosses present a barren, naked and cheerless aspect.

These peat mosses though generally considered as resting on a gravel bottom, are not without many exceptions: the bottoms of some of them, which have been reached, rest on a stiff tenacious clay. An extensive peat moss near Sterling, from which a great portion of the peat soil has been removed, presents this latter appearance, and is now becoming a rich and productive soil. The agent employed in removing this soil was water, aided by having ditches or canals cut where necessary. The almost incredible masses of this species of soil thus removed and carried by streams of water into the river Forth, and becoming united with other alluvion, has been the means of forming some rich alluvial deposites on the shores at the head of the estuary of the same name, into which that river empties itself. In one place, a farm of considerable extent has thus, with the aid of embankment (so formed as to admit the flow of the tide, and to retain the alluvial matter contained in the water,) been formed; and what was less than twenty years ago a bay covered by the waters of the German Ocean, is now a rich and fertile soil. In some instances, these peat mosses cover soils to a great depth, which at an early period, appear to have been covered with forest trees of large size, many of which are frequently found, and some oaks in a state of excellent preservation.

The soil of the greater part of the heath-covered

land in Scotland, is generally termed peat earth, but which differs considerably from the peat moss. It is much less spongy, and much more mixed with the other common soils, and fewer of the mosses grow on this soil, than on the peat mosses. Ferns grow abundantly: the most common are the *polypodium vulgare*, *pteus aquilina*, or brake, *scolopendrum officinarum*, &c. Heaths in this soil grow luxuriantly, principally the *erica vulgaris*, *herbacea*, *dumosa*, with many sub-varieties. Some of the Myrtle family are also plentiful, such as the *vaccinum myrtillus*, or black berry, *vaccinum vitis idœa*, or crowberry, &c. the grasses on this soil are also of a coarse quality, but afford tolerably good sheep pasture. This soil in some situations is comparatively easily improved, by paring, burning, and the use of lime, &c. and which speedily makes the soil undergo an entire change.

From what I know of the different peat soils in Scotland, and from a careful examination of this specimen from the Dismal Swamp, I believe myself warranted in saying, that it is what in that country, is termed peat soil, earth, or moss. I have never before seen any such soil in this country.

A. NICOL.

From the (British) Quarterly Journal of Agriculture.

ON MOSS IMPROVEMENTS.

By Mr. A. Blackadder, Land-valuator and Surveyor, Allan Park, Stirling.

Much has been written upon Moss as an agricultural soil, and many will be ready to conclude that nothing farther can be brought forward worthy of attention. Men of the first-rate talents and of extensive acquirements have studied its chemical qualities, and with every opportunity for observation and investigation, have, without prejudice, recorded facts. Agriculturists of enterprise and skill have made experiments with a view to reclaiming or improving mosses; yet, after all, on no subject are opinions more at variance. Theory is opposed to theory, facts opposed to facts, and experiments present the most opposite results. It is natural to ask, how is this? I am disposed to reply, that the true and only cause is, that little or no attention has been paid to the different kinds of moss; and this seems evident from the circumstance that none of the writers on the cultivation of moss give a full description of the nature and quality of the moss treated of, as if all mosses were the same; than which there cannot be a more fatal mistake, owing to which much money has most unprofitably been expended, and on account of these manifold failures, many have been deterred from attempting moss improvements, where the result would have been highly advantageous. This is a consequence not less to be deplored when we consider what a vast extent of the surface of the three kingdoms is under moss, and that its baneful effects are severely felt on the adjacent crops, from the cold and humid atmosphere which its presence engenders; for who does not know that in very few seasons will even oats or potatoes come to maturity in the vicinity of moss; and that, in our best seasons, they are inferior, owing to the early frosts rendered more intense by copious evaporation.

It is therefore proposed to state some things essential to be kept in view before entering upon moss improvement, viz. The subsoil—the order of the super-position—the comparative thickness of the subordinate moss strata, and their diversified composition—the state in point of humidity and capacities for drainage—proportion of commixed earthy matters—superficial alluvial depositations—substances acting as decomposing applications—the nature and uses of the adjacent rocks and their earthy covers—and the prospects of improvement.

Subsoils of Moss.—These formed the common surface soil prior to the growth of the moss, and are as diversified as can be supposed. If they are deep and rich, and the superincumbent moss of a moderate depth, the most lucrative course, where other circumstances concur, is to float off the moss entirely, and cultivate the subsoil, as has been done to the extent of some thousand of acres in the Vale of Forth, in Scotland; but if it cannot be floated off, and is only one or two feet in depth, a similar permanent improvement may be effected by ploughing and burning, until the subsoil is reached. Again, if the moss is shallow, and the subsoil sand, or such like inferior soil, the best improvement is a top-dressing of one or more inches, to be obtained by casting out the subsoil from parallel ditches, and, however poor the quality, it will decompose the moss, and produce a good pasture. But another reason for examining the subsoil is, that the richer it is, other things being equal, the richer the nature of the plants which it originally produced, and also that of the subsequent peat earth. Nor should it be forgotten, that not unfrequently the subsoil of moss is a valuable shell marl.

Composition of Moss Proper.—Every one at all conversant with moss, knows the worthlessness of "flow moss" (the produce of Sphagnum, Hypnum, &c.) either as a soil or for fuel, and it is indeed the most indecomposible of plants of so soft a texture; unhappily it is of all others the most prevalent in the less elevated mossy grounds. If, therefore, it forms the surface cover, any prospect of a high degree of fertility must necessarily be distant; but if it be covered by a stratum of decayed heath, bent, cotton grass, &c. the quality of the moss soil is much better. Other mosses are chiefly composed of reeds (arundo.) horse tail (equisetum,) trefoil (menyanthes trifoliata,) sedge (iris,) rushes (juncus,) &c. such more readily decompose, and form a much richer soil than either of the former. Nothing so well determines the quality of moss as the plants which it spontaneously produces; for the moss soil and its products are nearly of the same substance, and the crop of the preceding years is the soil in which the next crop vegetates. Again, the moss plants now vegetating, indicate the degree of moisture; for so soon as a permanent saturation is effected, the sphagnum, &c. is produced to the almost total exclusion of the other plants; but on the water being drawn off its dies, and is succeeded by heath and sundry coarse aquatic grasses; or, if rendered sufficiently dry, bent grass prevails. If decomposition is by any means effected, then rushes, and also the finer pasture-grasses, supplant the latter. While moss plants continue still to grow, it is evident that the depth of moss must be still on the increase, and this by reason of the antiseptic qualities of its products; but where by any means pasture-grasses, or even rushes, abound, it is manifest that the proper moss

is in a state of decay, decomposition has commenced, and a very different soil is presented, and of course a different treatment is called for. Had these circumstances been brought under notice by writers on moss improvement, not only would their conflicting statements have been avoided, but immense sums saved, or applied usefully and to permanent advantage, which oftentimes have been worse than thrown away.

Depth, Humidity, and Draining.—Mosses of great depth, or vertical thickness, and having a nearly level surface, are generally more elevated, softer, and more fluid towards their central portion. It is a common practice to encircle them with a main drain, which indeed prevents flooding from higher grounds, but has little or no effect in draining the area of the moss field. The main drain should invariably pass through the centre of the softest or deepest part of the moss; and although that should be the highest, it will very soon become the lowest, and produce a subsidence and inclination towards it, on all sides. It is commonly objected to this course, that the moss is too soft to admit of it; and, indeed, if the drain is at the outset made more than one foot in depth, the matter thrown out will soon press the sides together, or even cause the bottom to swell up. This difficulty is, however, not insurmountable, if operations are carried gradually, and if at the same time with the main drain, smaller ones are led off from it, at right angles, in parallel straight lines, and only made deeper as the moss consolidates. In the vicinity of a large river, or of the sea, the whole excavated moss of the principal drains may better be floated off; and where too elevated to admit of a stream of water being brought over it for that purpose, the main drain may be deepened for a time, merely by the rain water collected on the surface. This course was effectually employed in a drain a mile and a half in length, in Blair Drummond moss, in Pertshire, under the eye of the writer, and under the direction of his father. The moss was eighteen feet deep, and so soft that boards were necessary even in the dryest season to support the feet from sinking when only walking over it; and indeed on one occasion it burst out and covered many acres of the adjoining arable plain, and surrounded several houses, surmounting every obstacle adopted to obstruct its course. Whatever be the nature of moss, it is on all hands agreed that no improvement can be made without draining. Yet it must be a primary consideration, whether, under all circumstances, the expense even of draining would be well bestowed, although, were even the pernicious effects on vegetation and animal life included in the estimate; yet on the latter account, it is most desirable that all mosses were effectually drained. The facilities for this purpose ought indeed to be among the first inquiries, and that not merely whether there is a superficial inclination, such as might be sufficient for draining other soils, but also making allowance for the subsidence of the moss, consequent on draining, which may average one-fifth of its depth. If there be a permanent stream through the main drain, liable to occasional increase, allowance must be made so as it may be sufficient to contain the whole, and thereby avoid all flooding; but otherwise no drain in any kind of moss need exceed four or five feet in depth, and for covered drains a depth of three feet is quite sufficient. These being straight, and parallel to each other, and discharging into larger subdivisional drains, and being distant from each other from twenty-four to forty-eight feet, according to the nature of the moss, will in general be found quite sufficient. There is no danger of over-drying moss by draining; but there is much danger of this being done by trenching; moss should never be stirred for cropping to a greater depth than eight or nine inches.

Manures, &c. for Decomposing Moss.—Adjacent rock strata ought to be carefully explored, as in general they have each their corresponding earthy covering more or less adapted to the purposes of vegetation. Where the rocks are of the primitive class, or of the coal formation, their disintegrated portions, and oft-times their superficial covers, are of inferior value as a soil; but even the rock earth of the latter, as also of clay-slate, lime, or even the old red sandstone, though not previously mingled nor superimposed in the moss, are yet valuable as ingredients of composts for top-dressing; as are also those of the purer sandstone, greenstone, and sea sand, containing calcareous matters in a state of decomposition, or even when these are absent. While sand laid over moss produces rapid decomposition, and consequent vegetation, no such effect is produced by the purer clays. Putrescent matters, whether animal or vegetable, possess the most powerful influence. Lime, unless in compost, seems to have no such effect on simple mosses; and its effects on mixed mosses, or those in a state of partial decomposition, must depend on the quantum of foreign matter and other circumstances. Examples might be given in illustration, and also of numerous failures in moss improvements, which have nevertheless been lauded as if attended with complete success. Regarding these and some other matters, a future opportunity may perhaps be afforded for offering further remarks.

Prospects of Advantage by Improvement.—The value of moss greatly depends on local circumstances; and particularly with regard to the supply of operatives at the commencement of improvements; access to putrescent manures; markets for the sale of the produce; soils affording materials for top-dressing; and turf suitable for wedge-drains; or for drain tile, or stone for drains, or clean gravel if found preferable; the expense at which these can be laid down at the moss must enter into the calculation. Or, again, if the moss is to be entirely removed, whether an adequate supply of water can be obtained with access to a river or to the sea into which it may be floated off. Nothing adds more to the intrinsic value of moss than mixtures of other soils during the progress of its formation, either by means of the winds carrying drift sand, or by water transporting earthy particles. When, again, a considerable quantity is thus superimposed, the soil ceases to be a moss, properly so called, and is an alluvial soil upon a moss subsoil. In either case little more is required than thorough draining, in order to the production by ordinary means of the best crops; and such is the description of the greater part of the mosses hitherto successfully improved in Scotland. There are, however, more of this description of mosses than is generally supposed, for the commixion of foreign materials is not easily detected by the eye, excepting by the inspection of dried portions in a strong light after being recently broken across,

when the minute siliceous particles become sufficiently apparent.

N. B.—The obvious results, merely, of the addition of siliceous sands to mosses, have been brought under notice in the preceding remarks. Were the principle upon which the sand operates satisfactorily determined, it would doubtless form a valuable acquisition to agricultural science.

A Cultivated Moor.—The following is a sketch of an attempt to cultivate a moor, dashed off by a hand, the productions of which can never be mistaken. The moral of this graphic picture is, that there is a wrong as well as a right way of improving a moor.

The Moor.—It was then ever so many miles long, and ever so many miles abroad, and nobody thought of guessing how many miles round; but some dozen years ago it was absolutely measured to a rood, by a land-louper of a surveyor—distributed—drained—enclosed—utterly ruined forever. No—not forever. Nature laughs to scorn acts of parliament, and we predict that, in a quarter of a century, she will resume the management of that moor. We rejoice to hear that she is beginning already to take lots of it into her own hands. Wheat has no business there—and should keep to the carses. In spring, she takes him by the braird till he looks yellow in the face long before his time—in summer, by the cuff of the neck till he lies down on his back and rots in the rain—in autumn, by the ears, and rubs him against the grain till he expires, as fashionless as the winnle-straes with which he is interlaced—in winter, she shakes him in the stook till he is left but a shadow, which pigeons despise. See him in stack at Christmas, and you pity the poor straw. Here and there bits of bear or bigg, and barley, she permits to flourish; nor is she loath to see the flowers and shaws and apples on the poor man's plant—the life-sustaining potato—which none but political economists hate, and all Christians love. She is not so sure about turnips, but as they are a green crop, she leaves them to the care of the fly. But where are our gowans gone? There they still are, in flocks which no cultivation can scatter or eradicate—inextinguishable by all the lime that was ever brought unslokened from all the kilns that ever glowed—by all the dung that was ever heaped, fresh and fuming from the Augean stables in the land. Yet her heart burns within her to behold, even in the midst of what she abhors, the large dew-loved heads of clover whitening or reddening, or with their rival colors amicably intermingled, a new birth, glorious in the place of reedy marish or fen, where the cat's-paw nodded—and them she will retain into herself when once more she rejoices in her Wilderness Restored. And would we be so barbarous as to seek to impede the progress of improvement, and to render agriculture a dead letter? We are not so barbarous—nor yet so savage. We love civilized life, of which we have long been one of the smallest, but sincerest ornaments. But agriculture, like education, has its bounds. It is, like it, a science, and woe to the country that encourages all kinds of quacks. Cultivate a moor! educate a boor! First, understand the character of clods and clodhoppers. To say nothing now of the urbans and suburbans—a perilous people—yet of great capabilities; for to discuss that question would lead us into lanes; and as it is a long lane that has never a turning, for the present we keep in the open air, and abstain from wynds. We are no enemies to poor soils, far less to rich ones, ignorantly and stupidly called poor, which under proper treatment effuse riches; but to extract from paupers *a return* for the expenditure squandered by miserly greed on their reluctant bottoms cold and bare, is the insanity of speculation, and such schemes deserve being buried along with their capital in quagmires. Lord! how they—the quagmires—suck in dung! You say they don't suck it in—well then, they spew it out—it evaporates—and what is the worth of weeds? Lime whitens a moss; that is true, but so does snow. Snow melts—what becomes of lime no mortal knows but the powheads—them it poisons, and they give up the ghost. Drains are dug deep now-a-days—and we respect Mr. Johnstone. So are gold mines. But from gold mines that precious metal—at a great expense, witness its price—is exterred; in drains that precious metal, witness wages, is interred, and then it becomes *squash*. Stirks starve—heifers are hove with windy nothing—with oxen frogs compete in bulk, with every prospect of a successful issue; and on such pasturage where would be the virility of the bulls of Basham?

MODE OF EXACTLY REPRESENTING LEAVES.

To the Editor of the Farmers' Register.

Petersburg, Nov. 28, 1836.

Dear Sir,—In a note in the introductory part of Mrs. Lincoln's Botany, there is a recipe for taking the impressions of leaves. It is to smoke a sheet of oiled writing paper over a candle, until a sort of unctuous ink is formed—to apply this ink to the interior surface of the leaf, and then to press this *inked* surface on a clean sheet of thin letter paper. I tried this plan, and found it successful, but it was tedious and troublesome—since one blackening of a sheet would answer only for a very few leaves, and the repeated oiling of the paper jeopardized one's dress.

It occurred to me, that printer's ink would answer the purpose. I procured a small quantity of this article from the office of the Register, and had two small *dabs*, as I call them, made of cotton, covered with an old glove, the handle being a small wooden thread-spool sewed in. With this apparatus, I applied the ink to the leaf, and pressed it with a book, and I found the impression exact and beautiful. My next step in improvement, was to fasten two pieces of thick board together, by means of leather hinges—a primitive printing press.

A more complete and elegant machine, however, would be a merchant's letter press—which, when used in printing leaves, might be called the *leaf press*.

In towns, however, I agree with you, a printing press would be the best, and ready to the hand. By means of this machine, fifty leaves might be printed at once, and by inking both sides of the leaves, duplicate impressions might be made each time—one of the upper, and the other of the under side, which would make the number of impressions a hundred, and the same leaves from one inking, might be printed a number of times; and by *re-inking*, might be struck off "ad infinitum."

This mode of delineating leaves is preferable to any other, because it gives the very *fac simile* of nature—the veins, the outline, the very grain and

texture of the leaf—and, perhaps, by coloring the ink, the image of the leaf might be exactly given.

In this way, students of botany, may preserve impressions of the many thousand species of leaves, and travellers may adorn their *porte feuilles* with the foliage of the prairie, and the forest; and the daughters of our country-gentlemen may thus agreeably occupy the leisure of a summer morning in copying the beauties of nature, by a mode the least expensive or laborious, and the most exact and faithful, that can possibly be used.

I forgot to mention, that the outside quires of letter paper will answer perfectly well, and that when printed, a number of sheets stitched, make a leaf-book—a pretty ornament of the parlor; and, also, your suggestion that the paper ought to be dampened, by dipping the whole quire into a vessel of water, that it may the better absorb the ink; to which I will add, that, perhaps, printing paper would be the most suitable for this purpose—and, lastly, that what it takes so long to detail, is a perfectly simple process, and may be done in a minute.

Your obedient servant C. C.

For the Farmers' Register.

THE PORTSMOUTH AND ROANOKE RAILWAY. THE NAVIGATION OF THE MEHERRIN, NOTTOWAY, AND BLACKWATER RIVERS.

By the Editor.

The Portsmouth and Roanoke Railway route, as far westward as the Meherrin, is remarkably level—and of course the trains are propelled with proportionable facility, and diminished expenditure of power. It is, indeed, an admirable track for its general straightness, no less than its level course. But still there were great causes of difficulty and expense in the first construction, and so will there continue to be in future repairs. The country is low, and the streams passed are bordered by swamps or low-grounds, which required long bridges elevated on sustaining posts and framed timbers. All these bridges remain uncovered, except the one across the Blackwater, and of course their decay will be rapid, and very costly repairs will soon be necessary. After passing the Meherrin, the route is quite undulating, and generally ascending to where it crosses the Petersburg railway, less than two miles from the southern termination of the latter, at Blakely on the Roanoke.

I took my seat in the train at Suffolk, for the intersection near the Roanoke, there to take the Petersburg train, as the shortest way to reach the latter town. And circuitous as is the whole route thus passed over, I travelled the 118 miles from Suffolk to Petersburg in 9 hours—including all the stoppages, except one, of half an hour, between leaving the Portsmouth train and the arrival of the one for Petersburg. If the two companies would agree in their hours of arrival and departure, so as to permit such a journey always on stated days, (as might be done without inconvenience,) and the arrangement was made known, there would be many persons who would come by the two railways from Norfolk to Petersburg, rather than wait one, and sometimes two days, for a passage by the steamboats.

Both these two great railways cross the Meherrin and Nottoway rivers below their falls, and the Portsmouth road also crosses the Blackwater river—and this last, and that only below the railway, is alone made any use of for navigation to bring country produce to be put on the railway, for market. And it is probable that no such use would have been made of the Blackwater, for boats bringing crops made in the neighborhood, but for their being shown the way, by this being made a regular steamboat route from Edenton, and by which much cotton is brought from North Carolina, to be sent by the railway to Norfolk. The almost total disuse of these three easily navigated rivers, is one of the most remarkable instances of the inveteracy of long established habits in our countrymen, and the slowness with which they adopt improved facilities, when offered to their acceptance. These three rivers, though small, flow over very level beds, and would require but little labor and expense to be made navigable for flat boats for distances which combined, would make at least 120 miles, without including the Chowan, formed by the junction of the Meherrin and Nottoway, which is now used for navigation. The length of the Meherrin, from the lowest falls to where it unites with the Nottoway, to form the Chowan, is more than 50 miles, as measured on the map. The Nottoway, from its lower falls above the Petersburg railway, to the point of junction just named, is more than 40 miles—and the Blackwater from the southern line of Surry county, to where that river joins the Nottoway, is 30 miles.

From above the Petersburg railway, there are no falls, or rocks, in either the Meherrin or Nottoway—nor, indeed, any obstruction to downward navigation, except trees fallen by accident, or more generally by design, into the streams, and which, if sawed into pieces at low water, would all be swept away, together with the rafts and sand bars which they have served to form, by the first freshet. It is true, that these streams are very low in summer droughts: but the crops of the country (cotton and corn,) are seldom ready for market before the streams are full—and the timber which this navigation would bring into use, and make valuable for market, might wait until the water was sufficiently deep for its transportation. The Nottoway lands are among the most productive in the counties of Sussex and Southampton—and its passing through the heaviest producing region, is another reason why this river should be used for navigation. But because these waters led to no suitable market before, and because every farmer has always been in the habit of sending his crops to market by his carts or wagon, no one thinks yet of taking the far cheaper way of boats to either of the railways. Meherrin and Nottoway might doubtless be profitably improved and navigated far above their falls, as routes to the upper railway: but it would be idle to urge *that*, while the advantages offered by their far better waters below the falls are overlooked, and almost totally neglected.

It has been a long time since the attention of the writer of these remarks was attracted to the peculiar circumstances of these waters, and the advantages that might be derived from bringing them into use. To induce others more interested, and having more local information, to think upon that and other kindred subjects, the subjoined "Hints and Queries," were published in 1825; which may

now furnish some amusement, if nothing more, by the strong contrast displayed of the condition of things, and of prospects, then and now. If the reader, at this time, should condemn the scheme then proposed for bringing these natural canals into use, as altogether absurd and ridiculous, (as it certainly would have been, if the present state of improvement could have been anticipated,) let it be remembered, that at that time no one had thought of constructing rail roads in this region—nor establishing the now prosperous cotton and other factories, which will be so increased in time, as to require as much of the water of the Appomattox, as then ran in waste down the falls. For these two great improvements, the country owes much to the enterprising spirit of Petersburg—and to the fortunate results of these bold but judicious adventures, Petersburg owes her present and fast growing prosperity, which stand is such marked contrast to the state of decline which seemed progressive as late as when this piece was published. But the writer was not more in the dark then, as to the near approaching revival of the prosperity of Petersburg, from the railway and the factories then not planned, than he was in supposing that furnishing a proper outlet to the three rivers would bring them into use. They have now better outlets than he then supposed possible to obtain—being intersected, in five different places, by rail roads furnishing speedy and cheap conveyance to two different market towns: and yet these rivers are almost as little used now, as before the construction of these great works.

ON THE WANT OF UNIFORMITY IN THE STATED VALUES OF FRENCH AND OTHER WEIGHTS AND MEASURES.

To the Editor of the Farmers' Register.

Columbia, South Carolina, Nov. 23, 1836.

Dear Sir,—I should have replied to your letter before, but have been confined by violent indisposition and unable to work. I had mustered about twenty books of authority, for the purpose of drawing up a paper on the discrepancies of the system of weights and measures, published in our elementary books, deemed of authority on the question: but as you seemed to decline my offer, by taking no notice of it, I took no further trouble, and distributed my authorities, which I fear I shall not find leisure to collect again and compare.*

As a specimen, however, of the necessity of such a paper, I send you the following memoranda.

According to Dr. Redman Coxe, Dr. Gregory, Mr. Renwick and others, the French gramme is stated at 15444 troy grains, and the kilogramme at 15444 grains, whereas, the true number is 15434 grains. See the mistake explained in 1 Kelly's Cambist, p. 140, (2nd edit. 1821.) I wonder Mr. Renwick, whose useful little book, "Compendium of Mechanics," was published in 1830, should not have been aware of this mistake.

None of these popular compilations give you the barometrical and thermometrical degrees, at which the numbers are taken.

Again—A cubic inch of water, barometer at 29.5, thermometer at 60° of Fahrenheit, will weigh, according to Dr. Geo. Shuckburgh, 252.506 grs.
By Dr. Henry, of Manchester, 252.52
By Dr. Paris, 252.72
By act of Parliament, 5, Geo. 4, ch. 74, at 62° Fahrenheit, 252.458
By Mr. Hasler, (Report, 1832,) at 40 (Fahrenheit,) 252.7

Average 252.5916

So, Mr. Hasler, in his report to our Secretary of State, 1832, makes the metre 39.380, instead of 39.371. I suspect this is a typographical mistake for 39.370, at 32 of Fahrenheit.

By law (of all the old thirteen states, New York excepted,) the standard bushel is the Winchester bushel of 18½ inches diameter, by 8 inches deep, containing 2,150.42 cubic inches. The half bushel will, therefore, be 18½ by 4 inches. The model bushel kept in the Department of State, at Washington, holds (according to Hasler) 467,681.6 grains at 39.83 of Fahrenheit by actual measurement, and is therefore less than the legal Winchester bushel, by 75,294.4 grains, or 156.8 ounces, neglecting allowance for difference of temperature. The Winchester bushel at 62 Fahrenheit, contains 1131.89 ounces.

The present imperial bushel of England, contains (5 Geo. 4, ch. 74,) 2218.192 cubic inches, and holds exactly 80 lbs. avoirdupois of distilled water: that is, 560,000 grains; the troy pound being 5,760 grains, and the avoirdupois pound, 7,000 grains. So that the present imperial bushel, is to the Winchester, as 1.031 to 1.

It appears from the reports of Mr. J. Q. Adams, and Mr. Hasler, that the whole system of weights and measures throughout the United States, is irregular and inaccurate. The specimens kept at the custom houses of the seaport towns, and in the office of the Department of State, disagree with each other, and with the legal weights and measures. By *legal*, meaning those in use in England, before 5 Geo. 4, ch. 74, and adopted by the statutory enactment in all the old states. The alteration made by New York, has *no merit of any kind.* Had New York adopted the present imperial weights and measures of Great Britain, which possess all necessary practical accuracy and convenience, (Capt. Sabine's objections notwithstanding,) the weights and measures of England and America would coincide. This I recommended in a tract distributed at Congress, in 1824. I have now neither time nor the necessary collection of authorities, to pursue this subject farther. I send you a newspaper article on the subject, which shows the inconvenience the public submit to, for want of a regular system of weights and measures. The two commercial nations of the world are eminently Great Britain and the United States, and the advantages arising from their adopting one and the same system, would be very great indeed.

I am, dear sir,
Your obedient servant,
THOMAS COOPER, M. D.

* This seeming neglect or rejection of Dr. Cooper's offer, was far from being designed, as a subsequent letter has explained to him. Any contributions from his pen, that his leisure and convenience may permit to be offered, will always be highly acceptable.—Ed.

From the Columbia Times and Gazette.

BUSHEL AND HALF BUSHEL.

Sir,—Some time ago, I bought in this town a half bushel measure, branded S. B. 1835. It measured eleven inches and a quarter in diameter (inside measure,) and seven inches and three-quarters in depth. It contained therefore 770 cubic inches and one-third. But it *ought* to have contained 1075 cubic inches, and was, therefore, more than one-fourth deficient in size.

To any person acquainted with figures, this is plain. The area of a circle whose diameter is 11¼ inches, is 99.4 inches; which multiplied by 7.75 is 770.35.

By express statutory enactment in all the old thirteen States, New York excepted, the dry measure bushel is to be eighteen inches and a half inside diameter, and eight inches deep; and it shall contain 2150.42 cubic inches: hence, the half bushel must contain by law 1075 cubic inches, whereas the half bushel in use in Columbia, according to my specimen, contains but 770.

I presume the store-keepers buy and sell by the same measure, so that they are out of the question: but it is surely a public grievance which the public authorities ought to rectify, if the inhabitants receive the bulk of 770 instead of 1075. Ought not the intendant and town council to put this to rights? They possess, I believe, a copper bushel, but for what purpose I know not. The matter complained of is surely worth their attention.

I have said that, by the law of England, the only measure for corn and grain was the Winchester bushel of 18½ inches in diameter by eight inches deep, containing 2150 cubic inches. The acts of Parliament enforcing the use of the Winchester bushel, and prohibiting every other measure for corn, are 22 Ch. 2, ch. 8,22 and 23, Ch. 2 ch. 12. In 4 Term Rep. 750 and 5 Term Rep. 353, it is decided that no local usage will justify the selling of grain by any other measure than the Winchester bushel, or its aliquot parts. The colonies adopted the same measure, and the old thirteen states also by express law have done the same. About seven or eight years ago, New York chose to have its own peculiar weights and measures, and altered the old corn bushel, but no other state followed her example.

By Sect. 1. of Act of Assem. of South Carolina, of April 8, 1710, the standard of all measures used in Carolina is to be conformable to the measures of England: and by Sec. 2, any person who shall keep or use any weights or measures than such as are marked by the public officer, shall forfeit ten pounds. The mark is directed to be

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By Act of Assembly of South Carolina, 12 April, 1768, made perpetual by Section 1, of act of Assembly, of 12 March, 1783, it is ordained, that the bushel measure, the half bushel, peck, and half peck, shall be made *according to the standard of London*, that is, the Winchester measure ordained by act of Parliament. Also, that each measure shall be made of cedar wood, neatly shaped, and handled with iron.

The English Parliament in 1825, 5 Geo. 4, ch. 74, altered all the old weights and measures of that kingdom, and established what are called the imperial weights and measures. The old Winchester gallon (our *legal* gallon at this moment for dry measure,) contained 268.8 inches, which multiplied by eight gives 2150.4 for the bushel. The imperial gallon now contains 277.274 cubic inches, and the imperial bushel 2218.192 cubic inches. But no state in the union has adopted the imperial measure, or changed its old Winchester bushel of 2150 cubic inches—New York excepted. By act of Assembly of South Carolina, of 17 of March, 1785, the several justices of the county courts of this state, shall have full power and authority to regulate weights and measures within each of their respective jurisdictions, and shall enforce the observance thereof under such penalties as are provided by law for that purpose. As the Circuit Judges have succeeded to the power and jurisdiction of the County Court Justices, application may be made to the Circuit Court by the town authorities. Or, as every corporation may make a by-law in harmony with and in support of the laws of the land, the Intendant and Town Council, I apprehend, may lawfully enforce the existing acts of assembly, by a by-law prescribing the most convenient means of doing so.

The nearest approximation to the legal contents of the Winchester half bushel, will be a round measure thirteen inches and one sixteenth of an inch inside diameter, and 8 inches deep. This will be within about a cubic inch of 1075.

A BUYER.

From the Petersburg Intelligencer.

HINTS AND QUERIES

Submitted for the consideration of the Merchants of Petersburg, and the Farmers trading to that place.—Published in 1825.

Does the commercial prosperity of a town increase in full proportion to the increase of productiveness of the soil, and the profits of the farmers of its back country?—and is not the country interested in a similar and equal degree, in the prosperity of its market town? Can the one possibly derive profit from its labor, enterprise, or from the bounties of nature, without the other sharing largely in the benefit?

Have these truths been kept in view by us—or have we not (both of town and country) nourished a ridiculous hostility to each other, and opposed our own future profits, for the pleasure of neglecting or thwarting the present interest of our neighbors?

Has not our want of concert and good feeling hitherto prevented our obtaining any portion of the Fund for Internal Improvement? though that fund has drawn an enormous sum from this, for the exclusive benefit of other parts of the state?

Does not our section present valuable and profitable objects for improvements in water carriage—and if we will only look to our own interest, and will unite for its promotion, have we not both the right and the power to divert a due proportion of the improvement fund, for our benefit?

Have not the improvements of the Upper Appomattox been carried on directly contrary to the opinions of the best modern engineers? By

"*sluicing*," or removing shallows and obstructions, in a rapid stream, the still and deep waters are drawn off, and other obstructions are uncovered or caused to form: shoals of sand and gravel, if cut through, are again formed by the action of whatever first caused them; and even if the labor is not endless—if the bottom remains regularly graduated throughout—the certain consequence is, that the unobstructed stream will be more rapid, of course shallower, and perhaps as unfit for navigation, as when in a state of nature. The best and cheapest mode for improving streams like the Upper Appomattox, is by "locks and dams," by which still water of any required depth is obtained. Willis's River has been improved on this plan—and boats can easily navigate that inconsiderable stream, which cannot be carried thence down James River.

The lower parts of the Meherrin, Nottoway and Blackwater, (without including any part of Chowan,) together form good and uninterrupted navigable water for from 100 to 130 miles; and if desirable, it would be easy to remove the obstructions still higher up the Meherrin and Nottoway. Almost no use is made of this extensive means of transportation, because it does not lead to Petersburg, the nearest (and as yet the best) market for that country. Though navigable water continues thence to Norfolk, yet the low prices there, and the circuitous and difficult passage, have caused most of the produce to be brought to Petersburg, by from 40 to 70 miles of land carriage. Like causes have drawn to the same market the products of the Roanoke, contrary to their natural destination: but of that hereafter.

The circumstances which have hitherto made Petersburg the market for the waters of the Chowan cannot long continue, and the trade must take another direction, unless this extensive and now useless water-way is connected by a navigable canal with the Appomattox; and this seems quite practicable, and, in proportion to the expense, no other improvement promises more profit to both town and country. The head of Blackwater is within two miles of the Appomattox Canal Basin, and the latter is on a higher level. The present canal, enlarged throughout, and continued through Petersburg to the head of Blackwater, would empty all the water brought, down the Chowan: and the canal continued through Blackwater Swamp to where its own water would become navigable, would join, and bring into immediate and profitable use, the upper (and perhaps the lower) waters of the Chowan. It would be equal to adding to the canal upwards of 100 miles more, made almost free of expense.

If this scheme were completed, it would have the following beneficial effects:

1. The rich and very extensive swamp lands of Blackwater might be drained by digging the canal through their lowest part; and property to an immense amount would be formed from what otherwise must continue a worthless nuisance.

2. The expense of transporting produce would be reduced far below land carriage. The expense saved would operate as a high premium for increased cultivation and improvement of the soil.

3. The whole of this increased product would add to the trade of Petersburg, and by that means every part of its back country would be indirectly benefited.

4. Provided the commercial enterprise of Norfolk continues torpid, and *provided the merchants of Petersburg give prices as high as those of Richmond*, the rich produce of the Roanoke would take this as the cheapest course to a good market, and perhaps this may be greatly reduced hereafter, by a cut from Roanoke to Meherrin. But this great object cannot be gained—nor will the present trade of Petersburg be saved—if it does not compete in prices with Richmond.

Cannot commodities be exported from Petersburg as cheaply as from Richmond? And if so, why are not equal prices given, and equal profits made?

The trade of the back country of Petersburg is taking the course to Richmond, higher prices serving to more than compensate the difference between land carriage and the present bad navigation of the Appomattox. Wheat and tobacco are carried from south of the Appomattox, and sometimes through Petersburg, to the Richmond market. It is even apprehended by many, that the new Manchester Turnpike, (which ought to be highly beneficial,) will injure Petersburg, by facilitating this passage: but, if equal prices are not given, it requires no prophet to foresee that Petersburg will be ruined, and every farmer of its back country be (in effect) removed twenty miles further from market, even without the aid of the Manchester Turnpike.

In offering these hints, I have no inducement which ought not equally to operate on every man in this part of the state. I have no concern in commerce, or town property—and if every proposed improvement was completed, they could not increase the product of my land, nor give me a better passage to market. Neither do I profess to be particularly informed on any of the subjects of improvements now proposed. The purpose of these hasty and loose hints will be answered if the thoughts of those interested are directed to this subject—and the exertions of the people and the intelligence of their representatives be engaged heartily in promoting the hitherto neglected interests of the

SOUTH SIDE.

From the Silk Culturist.

PROSPECTS OF SILK CULTURE IN WESTERN VIRGINIA.

By the following letter from one of our correspondents, we are pleased to learn that the culture of silk is progressing in Western Virginia. Though every section of the United States may be truly said to be adapted to the cultivation of the tree and the rearing of the worm; yet we have ever considered the climate of Virginia as being peculiarly so, especially for the propagation and growth of the Morus multicaulis. The native mulberry, also, which is found in great abundance and luxuriance in that region, gives that State, at present, a decided advantage over that part of the country where it is not indigenous. They can commence operations immediately with a full supply of food, while others must delay until they can procure it from cultivated trees. The more we hear of the results of experiments in feeding with the foliage of the native mulberry, the more are we convinced of its value; and we would advise all, having it

within their reach, to feed upon it the coming season; and we have no doubt of their producing silk of a good quality, and in quantities which will afford them a large profit.

In recommending this course, however, let us not be understood as advising them to neglect the cultivation of the white mulberry, and especially the Morus multicaulis. The former, should it not be wanted for foliage, is valuable for timber and fuel, and the latter is, in our opinion, decidedly the best variety for the silk worm. In order to insure the complete triumph of the silk enterprise, all species and varieties of the mulberry should be sought out and cultivated, and experience will ultimately teach us their respective values.—Ed. S. C.

Polsleys Mills, Monongalia County, Va.
October 11, 1836.

F. G. Comstock, Esq.

Sir,—In the course of February last, I read many encouraging accounts of the culture and manufacture of silk in the United States; and about the 15th of February last, I received a prospectus of the Silk Culturist, and the next day I obtained five subscribers, (including myself,) and have since ordered four copies more for my neighbors, and are pleased to see many of them taking quite a lively interest in the culture of silk. I sowed one-fourth of a pound of the white Italian mulberry seed last April, and three of my neighbors sowed the same quantity; but owing to the season being dry, our seed did not vegetate very well, as we did not obtain more than from 5 to 7,000 plants from the one-fourth pound of seed each—and there are many others that have sowed several ounces of seed in this place and vicinity. I have contracted for 200 Chinese cuttings for myself, and 550 for my neighbors. I intend to adopt Gideon B. Smith's, Esq. plan in cultivating the Chinese mulberry, as may be seen in the Silk Manual, published by Sinclair & Moore, of Baltimore, the first year, and Mr. Cheney's plan the second year—by laying down in a furrow the roots and branches as described by him in the last number of the Silk Culturist. I intend to transplant my white mulberry trees next spring, or fall, in the hedgerow form, on two acres of land, and in the course of two years time, I am in hopes that I shall be able to stock one acre with Chinese mulberry trees. Next summer I intend to build a cocoonery about 20 by 30 feet, two stories high, and feed a few thousand worms the same season, as an experiment, for information, although I have full faith in the culture of silk. I shall commence in a small way, and extend the business as my foliage will admit of. In the adjoining county, (Harrison,) John and Josiah Wilson, Esqrs. are preparing to engage in the culture of silk. I am informed they have from 10 to 15,000 White Italian mulberry trees from two to four years old, and intend feeding as many worms next summer as their foliage will admit of. They intend cultivating the Chinese mulberry next spring also. Two gentlemen in this vicinity have about 100 Chinese plants on their second years' growth; and one gentleman has three trees on their third years' growth, which have been killed to the ground for the two winters past; but they have grown from the root, this season, to the height of 7½ feet by the 1st of August, when I last saw them. The gentleman says the trees have ripened much better this season, than any season previous. He thinks they may stand the winter, unless it should be *uncommonly* cold. Although our climate is *usually much milder* than the climate of New England, we sometimes have severe cold weather here. I think we have, in few instances, a week or two at a time, as cold weather here as I ever experienced in Massachusetts—being a *native* of *Franklin county*, Massachusetts, and a resident in New England about thirty years ago. I have resided in Virginia about sixteen years, and have had an opportunity of knowing the climate of the two sections of country.

Amos Brooks, Esq. of French Creek, Lewis County, Virginia, has about seventy Chinese trees, on their two or three years' growth, and has been multiplying them as fast as he could by means of layers, and expects to have from 5 to 6,000 cuttings from them for sale this fall. Messrs. Francis Pierpont & Sons, have fed 6,000 worms this season, from which they obtained 37½ pounds of cocoons; and Mrs. Pierpont made several skeins of white sewing silk of an excellent quality; but the remainder of the cocoons she reeled suitable for stockings. The above worms were of the white kind that commenced spinning at about thirty days old; the eggs were obtained at Meadville, Pennsylvania. The worms were, when at their full growth, three inches long. They made most of their cocoons white, but many of them were yellow. John S. Barns, Esq. obtained 1,000 eggs from Hartford, Connecticut, last spring, and they were about six weeks old when they commenced spinning; but did not do very well, as many of them died before they commenced spinning, owing, probably, to its being a very cool, rainy time for about ten or twelve days, commencing about a week before they commenced spinning. What cocoons they made were of a large size. The worms were of the large brown kind.

Henry Morgan, Esq. fed a few thousand worms of the same kind, with about the same success that Esquire Barns *had*, under the *same circumstances*, it being at the same time. All of the above gentlemen fed on the native mulberry, which is very plenty in this section of the country.

Yours respectfully,

E. NEWCOMB, P. M.

Extracts from the Journal of the Franklin Institute.

LIST OF PATENTS ISSUED IN MARCH, 1836, FOR IMPROVEMENTS OF MACHINES, &c. TO BE USED IN AGRICULTURE, OR DOMESTIC ECONOMY.

With remarks, by the Editor of the Journal of the Franklin Institute.

For *Cutting and forming heads of Barrels, &c.;* Hiram Andrews, Canaan, Litchfield county, Connecticut, March 2.

Various machines are in use for cutting heading for casks, &c., but that described in the specification of this patent appears to be sufficiently new to justify a claim to invention. The heading is to be cut rounding by means of a concave, circular saw on a revolving shaft, within which saw there is a circular cutter, of somewhat less diameter than the saw, and in contact with it, furnished with

teeth so formed as to give the proper bevel to one side of the head. A similar cutter on another shaft bevels the opposite side of the head, the latter being properly secured on a revolving platform, operating as a chuck. The drawing is very indifferently executed, affording but a general idea of the machinery, and is, therefore, not such as the law requires. The specification affords a good general description, but no more; and the claim is to "the combination of the several parts of the machine, and the placing them in the position which effects the object of cutting and forming heads for any casks of any dimensions." Such a claim we do not think good, as it does not designate any particular combinations, as characteristic of the machine, whilst several of the things combined, have been similarly arranged in other machines, for the same, or other purposes.

For an improvement in the *Axles of Wagons, Carriages, &c.;* Spencer Coleman, Mount Pleasant, Spottsylvania county, Virginia, March 2.

These axles are called rolling axles, and from the description it appears that they are so denominated from the whole axle being allowed to revolve in boxes fixed on the bolster, or other suitable part, of the frame of the carriage; whether the wheels are also to revolve freely on the axles we are not told, but suppose that they are, otherwise there would be a difficulty in turning the carriage. There is not any claim made, and the patentee is in error in supposing, as he must, that the revolution of whole axle is a novelty.

For a *Churn;* Amos Hanson, Windham, Cumberland county, Maine, March 2.

The cream is to be put into a square box with a curved bottom, and to be agitated by means of revolving *ladle boards*, or dashers, which are to be moved by a cog wheel and pinion. The claim is to "the gearing that is attached, and that operate said machine"!!

For an improvement in the *Bar-share Plough;* William P. Cannon, Monroe county, Tennessee, March 4.

Claim.—"What I claim as my invention, and not previously known, in the above described plough, is the mortise, heel plate, and screw, on the horizontal bar, allowing the plough to be regulated in the depth by turning on the heel screw, instead of the eye or ratchet, which rendered the plough stationary as to depth, unless through the alteration of the horses' hames. And in discovering the property, and first making of the mortice in the upright, or perpendicular bar, so as to fix the plough at any depth desirable by the moveable rivet."

For *Cotton Gin Grates;* Edwin Keith, Bridgewater, co. of Plymouth, Massachusetts, March 4.

This patent is taken for making the grates of cotton gins of chilled cast-iron. The method generally preferred, is to form the slots in the grates by laying plates of iron in the flasks when casting, which chills the parts where the saws operate; sometimes, however, the whole face of the grate is to be chilled. The claim is to "the making of grates for cotton gins of cast-iron, or other fusible metal suitable for the purpose, in sheets of two, or more, connected at the end; and of chilling them either in the whole or in part, as described."

What "other fusible metal" is suitable for the purpose, we do not know; these words, it is true, will do no harm, but they are unmeaning, and intended to guard against some airy nothing.

For an improvement in the *Plough;* David Prouty, and John Mears, Boston, Massachusetts, March 4.

The claims made consist, "First, in the inclining the land-side, so as to form an acute angle with the plane of the share. Second, the placing the beam on a line parallel to the land side, within the body of the plough, and its centre nearly in the perpendicular of the centre of resistance. Third, the forming of the top of the standard for brace and draught." These points, it is stated, are not claimed separately, but in combination with each other. This plough, we are informed, has been highly approved by those farmers who have used it.

For a *Smut Machine;* Marcus P. Spafford, Gainsville, Genesee county, New York, March 8.

A conical body is to revolve within a conical case, as in many other smut machines. Both the exterior of the runner, and the interior of the case are to be first covered with sheet-iron, and then with sole leather, and through these coverings iron teeth are to be driven, cut nails answering the purpose. A fan-wheel is employed to blow through between the runner and the case, so as to drive the separated smut, &c., entirely away. A second fan-wheel below the machine is to effect the final cleaning. The patentee says that he "does not claim any part of the above construction other than the combination of the leather and sheet-iron, to retain the teeth, and in separating smut from grain, so as that they shall be immoveable; and also the adaptation of the fan on the top of the cone to produce a current of air downwards through the teeth."

For *Leaching Ashes, and making salts for Pearlash;* Elijah Williams, Erie, Erie county, Pennsylvania, March 8.

The instructions are to boil crude ashes in weak lye, or water, over a brisk fire, for about twenty minutes, the weak lye, or water, and the ashes, being in about equal proportions; this is to be let into the leach during the effervescence. The boiled ashes to be leached about eight inches in depth in the trough, boiling hot weak lye to be first used, and then boiling hot water. The lye is then to be boiled down in the usual manner.

The boiler should be made of sheet-iron, or copper, with a flat bottom, about three feet wide, and eight long, and twenty inches deep. The leaches to be of wood, with a flat bottom, and having a straw strainer, with a tube below for letting off the lye. Lye obtained by this process, and put through a lime strainer, will make good salts for melting. The claim is to "the boiling and leaching ashes, as above, without the use of lime, and making salts suitable for pearlash."

The above is the whole substance of the specification, if substance it have. To us, however, it is altogether obscure and indefinite.

For an improvement in the method of *Making*

Mould Candles; Jefferson Donlap, Village of New Holland, Lancaster county, Pennsylvania, March 8.

This is an apparatus for passing the wicks into the moulds, giving them the proper twist, and drawing the candles simultaneously from the moulds. The machine appears to be well adapted to the purpose, but would require more than a verbal description. The whole arrangement is claimed.

For the *Application of latent heat to Cooking, &c.;* Peter Wenn, an alien, who has declared his intention to become a citizen of the United States. Philadelphia, March 8.

It is a little surprising that a patent should be obtained for a contrivance so manifestly useless in an economical point of view, as it is scarcely to be expected that any number of persons would purchase what few would receive as a gift, on the condition that they should use it. Passing over the false philosophy of boiling, &c. by latent heat, we proceed to state that the apparatus consists of a tin case, into the lower part of which quick lime is to be put, and upon this cold water is to be allowed to run, when, by the slacking of the lime, a sufficient degree of heat is to be disengaged to boil, stew, &c. &c. The claim "is to boil water, to bake, heat, cook, and to dry substances *by means of latent heat*, evolved in the before described apparatus, without the aid of fire, flame, or radiant heat; and the manner in which the apparatus is to be used as aforesaid."

As a mere article of curiosity the thing was well enough, though scarcely fit for a "nine days' wonder." The idea of laying in quick lime enough for fuel, of discharging and vending the slacked lime, with all their concomitants, is one which no person, possessing judgment upon the subject, would entertain for a moment; and we dare aver that the patentee would not continue to use his own apparatus in his family, were the lime sent to him gratis.

For a *Washing Machine;* Albion P. Arnold, Readfield, Kennebec county, Maine, March 12.

A double headed beater is made to vibrate in a trough in just the same way as in many other washing machines; and after giving the exact measures of the individual parts, the patentee claims "the fluted ends of the chest, the covering, the iron shaft and boxes, the steel spring and the lever on which it acts," to which might have been added "the washerwoman," if not previously claimed.

For a *Bed-bug Destroyer;* Brittain Garrard, Maysville, Blount county, Tennessee.

Although three or four patents have been obtained for scalding bugs to death by steam, and although the kind of thing used for the purpose was well known prior to the obtaining of the first patent, it seems that there are yet some which have escaped destruction. The present patentee makes some change in the arrangement of his steam kettle, or boiler, rendering it somewhat more complex, but we do not think more convenient, than heretofore. We shall not describe, as the patentee has not claimed, the alterations, or improvements, made in "the family safety scalding pot and steam engine."

For a *Mantle and Fender for Fire Places;* Elijah Skinner, Sandwich, Stafford county, New Hampshire. First patented April 19th, 1822. Patent surrendered and re-issued March 12.

Neither the original, nor the renewed, specification presents any claim, and the principal, we believe the only, difference between them, is that the description in the latter is less full and clear than that of the former. The mantle is to be of sheet, or of cast-iron, and projects out like a shelf, having a facing descending at right angles from it. The fender is to be a thing of sheet-iron, bent thus |‾; one edge of it going against the back of the chimney, and the other resting on the hearth, so as to cover the fuel and form a close stove. These affairs appear to be independent of each other, and ought, in this case, to have been the subject of two patents; we do not think, however, that the point is worth disputing.

For a *Cooking Stove;* John Liddle, Schoharie, county of Schoharie, New York, March 12.

A furnace is to be surrounded by a rectangular chamber furnished with doors, and intended either for baking, or boiling, having openings in its lower side, over the fire, to receive boilers; when used for baking, these openings are to be closed by a cast-iron slide. Each end of this chamber forms a flat flue, communicating with flues surrounding an oven which surmounts the chamber first named. As we are left to discover the novelties in this contrivance, by the entire omission of a claim, we shall transfer the task to the reader.

For a *Cast-iron Fire Place;* William Burgess, Middleborough, Plymouth county, Massachusetts, March 12.

An open cast-iron fire place is to have two or more ovens, at the back of it. The fire place must project out into the room, as the openings into the oven are at each end. There are also to be openings between, and at the back of the ovens, forming flues around which the heated air may pass. The claim is to "the application of the oven and cooking apparatus, to the common open fire place, or frame, as above described." The contrivance here reclaimed, resembles many others, and is not distinguished from them by any thing presented in the specification.

For a *Cotton Baling Press;* James C. Mitchell, Madison county, Mississippi, March 12.

In this press there are two followers, which, in pressing, are made to approach each other, by two shafts, each having a right handed screw cut on one end, and a left handed screw upon the other. The screws stand vertically, their upper ends revolving in collars in the cap of the press, and having spur wheels upon them above the cap. Their lower ends work in steps in the side of the press. The two followers have nuts let into them adapted to the screws. As this press is intended for baling cotton, there is a portion of each screw shaft, in the middle, which is left square, for nearly the thickness of a bale. A large spur wheel, on a vertical axis, turned by horse, or other power, mashes into the wheels on the upper ends of the screw shafts, the right and left handed screws then cause the followers to approach, or recede, according to the direction in which they are turned.

The dimensions of the respective parts, and the appendages necessary for the packing of cotton, are sufficiently described in the specification. The construction of the press, with the exception of the wheels for working it, is claimed as entirely new.

PROCEEDINGS OF THE AGRICULTURAL SOCIETY OF FREDERICKSBURG.

Communicated for publication in the Farmers' Register.

Annual Meeting, Nov. 11, 1836.

The Society was called to order by the Secretary, when the rule requiring the officers to be elected by ballot was suspended, and the Society proceeded to the election of their officers for the ensuing year: Whereupon the following named gentlemen were unanimously elected:

JAMES M. GARNETT, *President.*
GEORGE HAMILTON, 1st *Vice President.*
FRANCIS W. TALIAFERRO, 2*d Vice Pres't.*
R. B. SEMPLE, *Secretary and Treasurer.*

Many persons having petitioned to become members of this Society, they were severally admitted.

Allen W. Morton having, through the Secretary, presented to this Society two volumes—one a "Geological Reconnoissance of the state of Virginia:" the other, "Memoirs of the Agricultural Society of Virginia"—on motion of Major James Richards—

It was Resolved, That the thanks of the Society be tendered to Mr. Morton, through the Secretary.

The Society then adjourned to attend the exhibition, and to meet again at 3 P. M.

Evening Session.

The 1st Vice President in the Chair

The Committee on mares, colts and riding horses, report—That the exhibition of this year is not equal to the last; and furthermore report—That Mrs. Maria Taliaferro is, in their opinion, entitled to the premium for the best brood mare in consequence of the superiority of two fine colts by Truffle, which were exhibited with her—and that Mr. Rothrock exhibited the best colt. Their attention was called to riding horses--two were shown—one by John H. Lee, the other by Charles Tayloe—neither of which is considered as entitled to a premium, but are of opinion that Mr. Lee's horse is the finest. JAMES RICHARDS, *Chairman.*

The Committee on bulls award the premium to John H. Lee's young Durham bull, Preston.
ROBERT T. WILLIS, *Chairman.*

The Committee on milch cows award the premium to Thomas Scott's Alderney cow Red Rose.
R. T. WILLIS.

The Committee on beef, sheep and mutton, award to John F. Taliaferro, of Orange, the premium for the best grass-fatted beef—to John Glassell, for the best work ox—to John Gray, of Stafford, for the best mutton—and Wm. Pollock, of Stafford, for the best ram and ewe.
GEORGE ROWE.

The Committee on flour report—That they have examined two lots of flour, one exhibited by Mr. Robert Willis, of Orange, the other by Mr. Wheatly of Culpeper; and think them both of good quality—but award the premium to Mr. Willis; it being the unanimous opinion of the committee, that his was of superior quality.
WM. ROTHROCK, *Chairman.*

The premium was awarded to Robert Wallace, of King George, for the four best contiguous acres of Indian corn, each acre having produced a little less than 60 bushels.

The Committee on stallions and jacks report—That the premium for the best bred stallion be awarded to Mr. Dickinson, of Louisa, for his horse Falconi, by Sir Charles—also a premium to Mr. Marshall, of Culpepper, for his horse Young Macedonian, being a large, strong stallion, and calculated to improve our carriage and saddle stock. FRANCIS W. TALIAFERRO, *Chairman.*

On motion, Resolved, that George Hamilton Francis W. Taliaferro, and Wm. J. Rothrock, be appointed to form a scheme of premiums, and report to-morrow.

The Society then adjourned to 9 o'clock to-morrow.

Saturday, Nov. 12th,—2nd Day.

The Society met persuant to adjournment—the President in the chair.

On motion of James Richards,

Resolved, that hereafter all premiums awarded shall be paid in money to the successful competitor, who is under a pledge of honor to lay the same out in plate, with some inscription engraved showing it was obtained from the Agricultural Society of Fredericksburg.

After the adoption of some preliminary measures, the society then adjourned to the court house to attend the Exhibition of Domestic Manufactures, &c., and to hear the President's Annual Address.

Evening Session.

Persuant to appointment, the Society met—the President in the chair.

The Committee on Butter report—that after making an examination of a larger quantity of fine butter than they have ever seen exhibited, do award the premium to Mrs. Jean Morton, for the best lot of fresh butter.
WM. JACKSON, *Chairman.*

The Committee on Domestic Manufactures have awarded the following premiums, viz:

For the best carpet, $5, to Mrs. Thomas Scott, of Orange.

The best counterpane of wool, $3, to Mrs. Lucy Quarles, of Orange.

Second best ditto, $2, to Mrs. John C. Browne.

The 2d best ditto of cotton, $3, to Mrs. Wm. Rothrock.

Second best ditto, $2, to Mrs. William Skinker, of Fauquier.

The best pair of wool stockings, $1, to Miss Julia E. Hill.

The best piece of flannel, $5, to Mrs. L. V. Stevens.

The best piece of negro clothing, $5, to Mrs. L. V. Stevens.

They have also awarded discretionary premiums as follows:

For one piece of matting, $2, to Mrs. Aaron, C. White, of Caroline.

Two embroidered shawls, $2, to Miss Skinker of Fauquier.

One piece of jeans, $2, to Mrs. Cole Dickinson, of Caroline.

One bed quilt, octagon figure, $1, to Miss Berryman, of King George.

One cap of down, $1, to Miss Richards of Culpeper.

A piece of carpeting, $3, to Mrs. Vass, for the Female Orphan Asylum of Fredericksburg.

JOHN SCREW, C. C.

The Committee on Premiums report, That they have made the following changes in the scheme of premiums of the last year, viz:

For the best "*thorough or full bred*" stallion, $20.

For the best stallion without regard to blood, $10.

For the best colt or filly without regard to blood, not exceeding 3 years old the past spring $5.

For the best colt or filly "thorough or full bred," not exceeding 3 years old last spring, $10.

For the best contiguous 10 acres of wheat, to be measured (as heretofore) in the presence *of one person*. not less then 15 bushels to the acre, $10.

For the best ten contiguous acres of Indian Corn, to measnre not less than 50 bushels to the acre, and to be measured as heretofore save in the presence of *one disinterested person*, $10.

For the best 2 or 3 year old mule, $5.

On motion, it was Resolved, That the proceedings of this meeting, and the Annual Address of the President, be published in the Arena, Herald, and Farmers' Register. The Society then adjourned.

JAMES M. GARNETT,
President.

ROBERT B. SEMPLE,
Secretary and Treasurer.

ADDRESS TO THE MEMBERS OF THE AGRICULTURAL SOCIETY OF FREDERICKSBURG.

Communicated for publication in the Farmers' Register.

By James M. Garnett, President.

We meet, my friends, to commemorate this, our 19th anniversary, under circumstances peculiarly discouraging to our profession. Almost innumerable enemies, some of which have never assailed us before, have contributed nearly to *unseed* us, (if I may coin a word) as to wheat and rye, whilst our chief staple, Indian Corn, has been so extensively injured to reduce the present crop below the average, in many parts of this and other corn-growing states. The cotton crop too, has been so late in ripening, that much will be injured by frost. I mention not, however, these thing, by way of uttering Jeremiads, for which I never had any fancy, but to urge upon you, most anxiously, the necessity for greatly increased exertion on the part of all who have patriotically resolved never to give up our good old ship, Virginia—*she*, who has weathered so many storms—*she*, who has carried us and our forefathers through so many perils; and who has yet soundness and strength of timber enough to bear all her faithful and gallant sons, gloriously through every present and impending danger—provided only, that they will be *true to the last.*

To doubt this, would be to inflict a deeper pang on my heart than it has ever felt on public account; and, therefore, I will hasten to more cheering views of the prospect before us; a prospect which nothing, I think, can prevent the present generation, especially the younger portion of them, from realizing, but their abuse or misuse of the blessings so amply bestowed on us by an all bounteous Providence.

But before I present these views, permit me, in conformity to a practice commenced last year, to detail briefly the few experiments which I have made since our last meeting. Three were made with corn. The first was to ascertain the difference (if any) in its produce, when planted in land ploughed up late in the fall, or in that prepared just before planting. Six or eight beds only were thus prepared—the others, on each side, for a considerable distance, having been ploughed in November last. The soil was dry and of a medium texture, between light and stiff, with a slight cover of weeds, crab-grass, and some scattering spots of white clover, "few and far between." The culture was the same, in every respect; but no difference whatever has ever been perceptible in the growth or condition of the corn.

The second experiment in the same field and soil, with the same working, as to time, was to ascertain the difference, if any, between corn worked entirely, after coming up, with the cultivator for which you honored me last year with a premium, and that which was cultivated with the plough, the hand-hoeing of each being the same. My eye cannot discover the least difference, although some have said they thought the corn made with the cultivator was best. In regard, however, to the saving of labor by the cultivator, there can be no variation of opinion—for it is certainly in the proportion of two to five and a half, or six. The third experiment was to determine, whether corn planted in high land, as late as the 30th of June, would ripen thoroughly. It was made with a few grains of yellow flint corn, brought by our old friend and secretary, Col. Gray, from Galveston Bay, in Texas, there called Spanish Corn. It was planted among some pumpkins, in land of very inferior quality, but manured in the hill with drawn ashes and plaster of Paris, in the proportion of three pecks of ashes to one of plaster; the quantity in each hill a small spadeful. Most of the silks on this corn were dry on the 86th day from the day of planting; but the hard, and unusually early frosts, prevented its ripening perfectly. From this single trial, made under such circumstances, I could form no conclusive opinion of its productiveness, in comparison with other varieties of corn; but its early maturity might render it valuable in difficult and backward springs. Perhaps, however, some of the varieties already in use among us might ripen quite as early, if planted as late as this was. But my present year's trial, which is the third with the Maryland twin-corn, (improperly so called, unless from 3 to 8 and 9 at a birth, can be called *twins*,) has so thoroughly satisfied me of its superiority, in all the most desirable qualities, to all the kinds heretofore tried in this part of the country, that I do not, at present, expect ever to plant any other;

although I shall not cease, on that account, to continue my comparative experiments with every variety that comes highly recommended by competent judges; for however fantastical and hobbyhorsical some of my agricultural notions may be thought, I confidently hope never to mount *an ear of corn as a hobby*; at least during my presidentship of your society. Deem it not, I beg you, an extravagant supposition; for I myself have seen several redoubtable riders thus mounted, as I could prove, if necessary, by a host of witnesses.

Every year, for many past, has contributed to convince me, that we shall have to rely more and more on the corn crop, as our chief staple, in all the tide water portion of Virginia. The importance therefore, of ascertaining which kind is most valuable, in every respect, is so greatly enhanced, as to require, on the part of every corn-planter, much increased care and attention in prosecuting his efforts to ascertain the fact. In the three years' trials made by myself, I have established beyond a doubt, that there *is a difference* of not less than 15 or 20 per cent, in favor of the twin corn, over two or three of the most popular kinds cultivated in those parts of Virginia with which I am best acquainted; but I would thank any gentleman, (whether hobbyhorsical or not,) if he believes that he has a preferable kind, to send me a few grains, and I will promise him a faithful and a fair trial, so far as I can possibly make it so. Permit me to invite all corn-planters to co-operate in making this trial next year, and so long as our society holds together. The labor and expense will be a trifle not worth estimating, while the gain may exceed all ordinary calculation: for none, I think, can now doubt, that Indian corn must be our chief source of revenue, in all the tide-water portion of Virginia, unless some other crop, yet to be tried, should prove its superiority. But, strange to say, although the fact is well known to most, perhaps to all of us corn planters—the majority seem content to go on, in the same humdrum way pursued by our great-great-grand-fathers—content, as it would seem,) to act as if we had arrived at the "ne plus ultra," of perfection in our particular calling. To address those who have adopted this creed would be quite as great a proof of hallucination in the preachers as in their audience; it would truly be preaching to deaf adders; but I have persuaded myself to believe, that there are a goodly number still among us, who have "*eyes to see, ears to hear, and understanding to comprehend*," all that most conduces to their own, and the general good, and therefore I earnestly repeat the vital invitation, "*hasten to rescue*;" for our dearest interests are in jeopardy.

Another of my experiments was with a variety of Indian pea sent to me by that very zealous and intelligent friend to agriculture and all its interests, Mr. Herbemont, of South Carolina. It is the same kind which he has so highly recommended in the Farmers' Register, 3d vol. page, 93 under the name of the Chickasaw pea; and as far as I can judge by my single trial, well deserves the recommendation there given of it. My peas were planted in hills, about three feet apart each way; from 2 to 4 in a hill, and nearly or quite 3 weeks after our first planting of other varieties. This I found to be too late to escape early frost. The ground was a spot of poor land marled last summer twelve months, for turnips. The pea-vines grew erect to the full height of 4 feet in the best gound, having uncommonly large and succulent stalks and leaves. The first and only gathering from only half a pint of seed produced so large a gathering as to justify the conclusion that they are very productive—for a far greater quantity was left on the vines. These were given to milch cows and hogs, which eat them very greedily. As a green dressing for land they must be far preferable to other varieties, for this is the only kind known to me which does not run, although growing very luxuriantly. This quality renders them best also, as long forage for farming stock, to which use Mr. Herbemont has applied them, and says that his "horses preferred them to all other fodder."

My experiment with the Guinea grass is still contined, although with less sanguine hopes of acclimating it, than I had at first. This is my third year of trial. The last unparallelled winter killed a large portion of the roots; but I collected the hardy survivors, and set them in rows 2 feet apart, near my stable. These have been worked three times with the hand-hoe, and cut five times, at an average height of fully three feet. My conclusion from this 3 years experiment is, that the Guinea grass, if planted where it is convenient to give it a slight covering, before hard frost, with straw or coarse litter, will prove a valuable auxiliary to lucerne, clover and other green food; and therefore is still worthy of cultivation in a country where natural grasses are so scarce as to render artificial ones necessary.

I have now given you the sum and substance of my experiments since we last met; and they are of so little ostensible value, that I should not have detailed them, but to comply with a determination made last year, to set the example of such a practice, in the hope of tempting others to pursue it, who would prove more capable than myself of thereby benefiting our society and the vital cause to which it is devoted. My *failures*, (by the way,) should have been stated, and I will now give them; for a fair detail of an unsuccessful experiment is often as instructive as that of the most fortunate a man can make. The trial of the skinless oat was continued—but produced little more than the seed. This, however, was *not adulterated*, as Mr. Prince has reported of *his*, in the Farmers' Register, but was quite as pure as the quart I purchased of one his agents, at the rate of sixteen dollars a bushel: of course, profit and loss must be charged with this failure. The reputation of the experiment of the drilled-wheat, in regard to which I reported so favorably, at our last meeting, proved to be nearly a total failure, as it fell somewhat short of two for one. Eight other bushels, which I sowed broad-cast, produced about the same meager increase of seed, and that utterly unfit either to grind or to sow. I have therefore bid farewell to wheat, as a staple crop, until some more adventurous farmer shall prove, that it may, once more, be made to advantage, in our part of Virginia.

Let me now endeavor to present those views of the prospect before us Virginian agriculturists, from which I confidently believe, that all true friends of our good old state may rationally conclude that they ought not yet to desert her, as they would a ship stranded upon a desert shore.

There are *yet* means vast in power, if not in va-

riety, to improve our husbandry—increase our agricultural wealth—and strengthen our security against desolating emigration; and nothing more is required to render them effectual for all these vital purposes, but *that* public spirit, untiring industry, activity and perseverence which characterize our northern and eastern brethren. Thousands of these are making fortunes—if not as rapidly as the cotton and sugar planters of the south, yet with all reasonable speed, and moreover, in peace and safety; while the latter are making them at the daily hazard of their lives; hazards inevitably produced by climate, or incidentally, but not the less certainly, by such universal laxity—nay, total inefficiency of legal restraints as most unquestionably renders the three great blesings of free government, life, liberty, and property, far less secure than in any of the old thirteen United States. I say not this from any invidious motive towards our younger sister states; no, God forbid; but simply to urge what I believe to be an undeniable fact as an inducement to prefer an old to a new-settled country; in other words, to live in and die by old Virginia. Without doubt there are thousands of as good moral men in the new states, as in the old; but the truth, I think, cannot be denied, that there is far less power—I will not say inclination—in the former, to restrain and punish the immoral portion of their population; and hence the perpetration of a much greater number of those outrages and crimes that mar the peace and happiness of every community wherein they are committed. The appetite for making money in the new states would be quite as strong in the old, if constantly stimulated and provoked by the same powerful incentives: for man is much the same in his passions every where. But we have less of that demoralizing spirit of speculation, engendered by the inordinate lust for wealth, because there are much fewer subjects and opportunities to gratify it. Our governments being much older, all the different trades, professions and callings, essential to a regularly organized society, have long existed among us, in a numerical ratio duly proportioned, or nearly so, to each other. The necessary consequence of this state of things is, that a systematic, uniform course of business is established for each, which, in a great measure, precludes speculation: labor, food, clothing, and all which constitutes the material for the internal trade and commerce of the country, possess an interchangeable value approaching much nearer to a certainty, and therefore affording far less chance for those inordinate gains so frequently made in new countries, and which form the sole temptation with most persons to seek them. The new settlers there, (with very few exceptions,) soon become, to the citizens of old countries, what the lottery brokers and dealers in that species of gambling are to the regular tradesmen and yeomanry in every country. The first cannot exist content with small, or even moderate profits; but live in a constant state of feverish excitement, and with an omnivorous appetite for gain, whose cravings increase with every new supply of food, however enormous in quantity that may be. This appetite by frequent indulgence, soon becomes a disease—not less destructive, both to moral and physical health, than drunkenness; and he who voluntarily, and with no better motive than to increase wealth already sufficient, places himself in an atmosphere wherein he is daily and hourly exposed to contract it, (as almost every settler in our new states does) can hardly expect to escape, nor does he merit exemption. The worst consequence of this all-absorbing passion is, that, in the universal scramble for dollars and cents which it inevitably produces, public spirit is paralyzed—our benevolent and social feelings are blunted, if not annihilated, our regard for the preservation of order and the inviolability of law is either lost or forgotten, and the moral condition of society grows worse and worse, until it becomes so intolerable as to end in civil commotion and bloodshed. Men know not themselves while living under a government of laws, where justice is regularly administered, and crimes certainly punished. But let them once get beyond these salutary restraints, and many of them soon become as different animals as if they belonged to an entirely different race of beings. To what other causes, but such as I have enumerated, can we ascribe the notorious facts, that in some of our new states, it has not unfrequently happened that citizens, in broad day-light, shoot, and assassinate each other with entire impunity, in their own houses, and in the public streets of their towns and villages; that the civil magistrate, in attempting the execution of his duty, has been mobbed and his life endangered; and that large bodies of men have, on some occasions, constituted themselves the judges, jurors, and executioners of several individuals, either by hanging them without any process of law whatever, or murdering them in a jail to which they had been legally committed? The creed and practice of such men might be given in a few words, and thus catechetically stated.

"Who made you? I don't know. For what purpose where you made? To do what I please, if strong enough, and to make money. What is the use of making it? To make more. What are the means? Any which you believe you can practice successfully. Are health, and life, and reputation worth risking for such a purpose? Aye, verily, and much more, since the command of money enables you to command every thing else in this world, except the three trifles just mentioned."

If it be asked, "why such remarks, in an agricultural address?" The answer is, that one of the most essential means to improve our husbandry will be to stop the emigration of our farmers and planters; and that such statements as I have given, founded upon notorious facts, must have a tendency, at least, to check the desertion of our state.

Another very effective means of improving our husbandry in general, and our agriculture in particular, would be to secure legislative aid for it; and this might certainly be done, if we could only prevail upon our agricultural brethren, one and all, forever to abandon the ruinous practice of making a man's political partyism, the chief, if not the sole test of his fitness to legislate for us. Rely on it, my friends, we never shall obtain any thing from our legislatures, constituted as they now are, and long have been—never indeed, until we send firm, well known, devoted friends of the landed interest to represent us, instead of men whose chief employment it has been, for years, to waste their own time and the public money, in utterly fruitless party quarrels, and vain boastings about their

own state, which these quarrels are ruining as fast as if that were their real and sole object. Banish all such men forever from your public councils—no matter to what party they belong, and we should find our agricultural interest cherished and treated as the great prolific germ, the vital food, of every other legitimate interest in the community. This has been, and all history confirms it, a cardinal article in the creed of every great statesman in every civilized country in the world, and their practice has most nobly proved it. In our own country, Virginia stands alone, I believe, in having done nothing—nay worse than nothing, for her agriculture; yet such is the inordinate pride and vanity with which the worthless demagogues have inspired her people, that they are continually exulting in her great national importance, while the husbandry, the chief, the only true source of that importance, may be figuratively said, to be actually bleeding to death for want of a skilful doctor. Look at New York, now decidedly at the head of the union, both in agricultural and commercial prosperity; and to what other cause is this attributable but to her wisdom and patriotism in fostering, by legislative means, these two great sources of national wealth, power and influence? She has not only a State Agricultural Society, encouraged by large appropriations of public money, and diffusing its benefits throughout her territory; but several of her most wealthy citizens, among whom the patriotic Stephen Van Rensellaer stands conspicuous, have contributed large sums towards the improvement of her husbandry. Yet *we Virginians*—citizens of a state, once the first in our confederacy, but now, (with shame, deep and bitter shame, do I say it,) among the last in relative importance, can fold our arms, apparently in perfect apathy, and look on with entire composure, at the rapid progress of other states in every good work; while our legislatures are making themselves laughing-stocks for the rest, by the eternal intermeddling with federal matters, over which they can exercise no control, to the utter neglect of those numerous legitimate means by which they might do much towards regaining, in a great degree, our former standing in the union.

Another effectual step towards improving our agriculture—a step by no means difficult to take—would be to economize our labor by improving our implements of husbandry and modes of culture, to the utmost attainable degree. Much remains to be done in both these particulars, as regards our great staple Indian corn. I can well remember the time, when it was cultivated at nearly four times the expense, that it is now; and scarcely a year passes in which I do not witness some, often great, improvement in the process. It would certainly be still more rapid among our members, if each would make it an invariable rule to report, at every annual fall meeting, any thing new to him, on this subject, which he might deem beneficial. Such a practice, I am sure, would become more common, if we would only divest ourselves of the idea, that, when we begin to make a written communication to our society, we are, in fact, preparing an article for a newspaper, instead of a plain, brief statement of facts for our members, which, although useful to ourselves, would not necessarily be published.

I have reserved for the last, the suggestion of two other modes—the one direct, the other indirect, of improving our husbandry, and rendering it so productive as to convince even the most sceptical that there is no necessity for abandoning our native lands to the wild animals of the forest. The latter plan is, to establish a State Agricultural Society, to be composed of members selected from all the other agricultural societies, to meet annually in Richmond, for the purpose of devising the best ways and means to promote those interests which our own legislators, whose especial business and duty it should be, have so long and so utterly neglected. Concert and co-operation, as a class, is what we most want, and this plan, if any, would secure it. Should our Society approve it, (and the vote will be taken this evening,) it may be published in time to be considered by the Agricultural Convention, which will probably meet in Richmond, either at the time appointed by the last, or at an earlier day. The members of that body may also have time to ascertain the wishes of their constituents on the subject, and come prepared to act accordingly.

The other suggestion, if adopted, will furnish "*another string to our bow*," by adding a new article to our staple-crops—new as a staple, but long and well known as a garden vegetable; but whether to call it long or short "*sass*," I do not know. I mean the *sugar beet*, so successfully cultivated in France that its culture is rapidly spreading over all Europe. It cannot admit even of a doubt that it will succed quite as well with us as in France, and probably better: for experiments have already been made which prove that the American beet yields more saccharine matter than the French beet, in the proportion of about 10 to 7; and in regard to the quantity that our soil is capable of producing, I will state a well authenticated fact, which, although single, ought to satisfy us that no fears need be entertained on that score. Mr. Lawrence Muse, for many years past a resident of Tappahannock, in Essex, and who was a gentleman of unquestionable veracity, once raised in his garden two beets of the long red kind, which he himself informed me were weighed in the presence of several other gentlemen, and that the largest weighed eighteen pounds four ounces, the smallest seventeen pounds eight ounces. I urged him several times, to publish the account in the newspapers as a match for some of the statements then going the rounds in all of them, during an unusual dearth of party-politics, of marvellous big pumpkins, squashes, ruta-bagas, and mangel-wurtzel, raised in the ungenial soil of Yankee Land; but his publication never appeared, although often promised; for my friend, unluckily, was one of that very numerous family called "*Procrastinators*," a family, by the way, which, I fear, has more members in our own dear state, than in any other that can be named. I speak *understandingly*, (as congress-men say,) on this subject, being at least cousin german to some who rank very high among the brotherhood; although I must confess that I do not pride myself much on the relationship. Among planters and farmers this family does quite as much mischief as the Hessian fly, the wheat worm, the chinch-bug and all the other flies, worms, and bugs put together, that war upon their crops; and the man who could devise an effectual cure for their besetting sin, would justly merit the highest civic honors which could be

conferred on him. Cure this, and we should no longer "postpone to a more convenient season," (as unbelievers do the consideration of religion,) matters that imperatively require our immediate attention. We should never lose, as now frequently happens, a subordinate and subsidiary, but still important crop, by delaying to secure it at a critical time, merely because, (as we say,) "*it would be working out of turn.*" We should do every thing at the right season, but the particular order in which they were done, would always be varied according to the changes of the weather, and the condition of our arable lands. There would be no interference in our agricultural operations, and of course, all would be performed without loss or misapplication of labor. Thus to act, at all times, is the great art to secure success in all the branches of husbandry; and none who practice it constantly, will ever be under any necessity to abandon their native homes, their friends and their kindred, for strange lands, in pursuit of riches.

In connexion with the subjects heretofore noticed, permit me to say a few words more; to which I invite the attention, not only of our members, but of all my auditors who may not have joined us. There are among you some very favorable symptoms of the spirit of internal improvement. But take care—take *special care*—that, in the exuberance and ebullition of your newly excited zeal, you do not overshoot the mark—you do not burst your boilers—by undertaking to do something or other, which nature has forbid. Take care, my good friends, that, where wealth is certainly to be obtained by managing properly *the surface* of our mother earth, you do not dig too deep into *her bowels* after it, merely because certain parts of this said surface exhibit indications, which many take for positive proofs, that there are beds of gold, copper, or other precious metals, some two, three, four, or five hundred feet below, which will soon make all the diggers after them as rich as Crœsus—that is, *if* such beds be certainly found; and also, *if* their veins (as they are called) be certainly very extensive, and *if* they will yield an abundance of ore that is very rich.

In striking contrast with the foregoing *ifs*, suffer me to add one, in regard to which, I think, there cannot be even a shadow of doubt. *If* you will improve your certain advantages, advantages which the dullest man may see and comprehend, such as the navigation of your river—your great water-power for manufactures—your public roads leading directly to this town—roads whose condition, at some seasons, would disgrace a community even of Hottentots; then as surely as the sun rises and sets, Fredericksburg, and the whole country connected with her, will rapidly increase in wealth and commercial importance, until she becomes one of the first towns in the state: for Nature, herself, has placed the means in sight of every one who will open his eyes to see them. So much by way of advice—a thing so frequently offered—so rarely accepted. But being confident that you will not mistake my motive, and that you will ascribe what I have said to the deep and sincere interest I feel in your welfare, I will make no apology, since I am sure it can do no harm and hope that it possibly may effect some good.

In conclusion, permit me to make one more suggestion, and this I address particularly to the ladies and gentlemen of this town and its vicinity. *It is*, that they will immediately form a Horticultural Society here. The advantages and benefits derivable from such associations, is no longer a matter of doubt or vague speculation. Wherever established, either in other countries or our own, they have certainly led, not only to vast improvement in the quality and quantity of supplies for the table, but to many important discoveries in regard to the multiplication and perfection of old and new varieties of garden fruits and vegetables, as well as to the introduction of many practices in the tillage and manuring of land, which are highly beneficial to the general interests of agriculture. Horticultural Societies, therefore, have nearly as high claims to the encouragement of all the true friends of husbandry, as agricultural societies themselves have. One of the strongest of these claims is founded on the fact, that we should have the ladies as our most efficient associates; the ladies, who are always friends to every thing which can meliorate and improve society. Horticulture is an employment in which they take a delight, almost instinctive, an employment for which a very great portion of them manifest a natural taste, and in which therefore, they are peculiarly fitted to excel. In truth, the virtuous and intelligent portion of their sex are to the moral world what flowers and fruits are to the natural—they beautify, adorn and embellish it, with its most attractive charms. Their aid is essential to the prosperity of all our pursuits; their co-operation to the success of every domestic concern; they call forth all the best affections of our nature, by encouraging us in every good word and work; while the greatest blessings of life cannot be half enjoyed without their participation.

From the Genesee Farmer.

APPLES FOR FATTENING HOGS

Although the attention of our readers has been before called to this subject, we believe its importance is too little appreciated generally; and as the present is the season for action, we shall lay a few facts before them, showing the advantages of employing apples as food for fattening hogs, over other substances. We shall first endeavor to show that they are a valuable kind of food, and secondly, that they are a cheap one.

First, with regard to their value. A correspondent of the Maine Farmer in 1834 made the following experiment. He commenced feeding his hogs on apples in August. A pig four months old and weighing 95 pounds, was fed 18 days as follows:—first, two bushels of sour apples, boiled with six quarts of oats and pea meal, weighing four and a half pounds, were given him. At the end of six days he had gained six pounds.—He was then kept six days on the same quantity of boiled sweet apples and meal, at the end of which time he had gained six pounds more. He was next fed on an equal quantity of boiled potatoes and meal, and at the end of six days he had gained only five pounds. Here the superiority of both sweet and sour apples over potatoes was decisively shown.

A correspondent of this paper at Lockport, in a

communication last winter, states that he shut up seven hogs about fourteen months old on the first of October; they were in poor condition, and estimated to weigh about 150 lbs. each, and worth in the market 12 1-2 cents per pound. They were fed fifty days on apples, mostly sour, boiled with a small quantity of water, with the addition of a bushel of bran and a pint of salt, to three bushels of apples. At the end of fifty days they were fed with twelve and a half bushels of soft corn in the ear, and afterwards slaughtered. The average weight of each was 272 pounds. Estimating the apples at 25 cents a bushel, the bran at 6 cents, and corn at 62 1-2 cents, the whole expense was $77.55, and the pork at $6.12 1-2 per cwt. $116, leaving a clear profit of $41.45. See whole experiment detailed, in Genesee Farmer, current volume, p. 61.

These experiments it will be observed, were with *cooked* apples. The practice has also succeeded when they have been fed in a raw state; though the latter is not as profitable, except on a very small scale, when the trouble and expense of cooking would be comparatively greater. In the following experiments, the apples were given uncooked. A correspondent in Onondaga county turned thirty hogs and from thirty to forty shoats and pigs in an orchard of 400 trees about the 15th of September, and they remained there until the latter part of November when they were slaughtered, with the exception of twelve dollars worth sold alive, and about a dozen retained as store pigs. They yielded about 5,450 lbs. of first rate pork, fattened on apples wholly, without any grain. This was the fourth experiment of the kind made by the writer, all of which were attended with comp'ete success.

In the 5th volume, page 324, of the Genesee Farmer, S. P. Rhoades of Skaneateles says, "a friend from Massachusetts informs me that he shut up a hog by himself, and fed him entirely on apples and water, last fall, and that he became very fat, was well filled, and the pork was hard and sweet as that fed on corn," He also states that when turned into an orchard where there are both sweet and sour apples, hogs will eat about as much of one as of the other.

In the Brattleborough Messenger, a correspondent says, "A man in Guilford, conversing on this subject, said to me, 'There is a hog that will weigh over two hundred; I brought him home in July on my back. I have given it nothing but apples, and a little slop for drink."

Secondly, with regard to the cheapness of this kind of food. This may perhaps be best determined by calculation. We will suppose that an orchard is planted on an acre of ground, and that the trees stand at a distance of twenty five feet asunder, which would not be too near when they are merely intended for this purpose. This would give about seventy trees to the acre. The trees at twenty five cents each would cost $18.75; and the expense of planting, supposing each tree to cost ten cents each, would be 7 dollars. While the trees are small, the land may be tilled and will produce as much as before; and from the time they begin to bear, they may be considered as paying for the ground they occupy, by their fruit. Such an orchard, therefore, in a good bearing state, would cost as follows:

One acre of land	$50 00
Seventy trees,	18 75
Planting,	7 00
	$75 75

The anual interest on this sum at seven per cent. would be $5.30, which would be the actual expense of each crop, as the pasture of the ground would pay for gathering. If each tree bears on an average five bushels a year, (this is low estimate if the most productive varieties are selected,) the annual crop would be three hundred and fifty bushels, which according to the preceeding calculation would be at the rate of one cent and a half a bushel. Estimating the cost at double this, the clear profit in the second experiment before stated, instead of being $41,45, would actually be $74,45.

One of our neighbors, last year, made forty dollars from a small orchard of about an acre, by fattening hogs, and reserved a large supply for winter and other use.

If instead of feeding potatoes to their hogs, farmers would sell their potatoes, and purchase apples for this purpose, they would find it to their advantage. In ordinary seasons, apples suitable for feeding may be had at one quarter the price of potatoes, or even less, and their superior value has been already shown. It would be far preferable, however, if they would raise their own apples, of kinds expressly for this purpose.

Extracts from Travels of a Philosopher.

CHINESE AGRICULTURE.

I arrive at Canton, where new objects of admiration arise; the noise, the motion, the crowd augment, the water, as well as land, being every where covered with multitudes. Astonished at the amazing appearance, I inquire into the numbers of the inhabitants of this city and suburbs; and after comparing different accounts, find that they must amount at least to eight hundred thousand souls. My surprise, however, is greatly increased, when I learn, that to the northward of Canton, about five leagues up the river, is a village named *Vachan*, which contains a million of inhabitants; and that every part of this great empire, extending about six hundred leagues from north to south, and as much from east to west, is peopled in the same proportion.

By what art can the earth produce subsistence for such numbers? Do the Chinese possess any secret art of multiplying the grain and provisions necessary for the nourishment of mankind? To solve my doubts, I traversed the fields, I introduced myself among the laborers, who are in general easy, polite and affable, with some share of learning, and knowledge of the world. I examine, and pursue them through all their operations; and observe that their secret consists simply in manuring their fields judiciously, ploughing them to a considerable depth, sowing them in the proper season, turning to advantage every inch of ground which can produce the most inconsiderable crop, and preferring to every species of culture that of grain, as by far the most important.

This system of culture, the last article excepted, appears to be the same that is recommended in all our best authors, ancient and modern, who have

wrote on this subject; our common laborers are acquainted with it; but how much must our European farmers be surprised, when they are informed that the Chinese have no meadows, natural or artificial, and have not the least conception of fallowing, never allowing their lands the slightest repose.

The Chinese laborer would consider meadows, of every denomination, as lands in a state of nature: they sow their lands all with grain, and give the preference to such grounds as we generally lay out in meadows, which, lying low and being properly situated with respect to water, are consequently by far the most fertile. They affirm that a field sown with grain, will yield as much straw for the nourishment of cattle, as it would have produced of hay, besides the additional advantage of grain for the sustenance of man, of which they can spare too, in plentiful seasons, a small portion for the animal creation.

Such is the system adhered to from one extremity of the empire to the other, and confirmed by the experience of four thousand years, amongst a people, of all the nations of the world, the most attentive to their interest. That which must render this plan of agriculture the more inconceivable to Europeans, is the idea of their never allowing their lands to lie one season unlabored. Those who for some years have endeavored, with such public spirited zeal, to re-animate amongst us this neglected art, have considered as the first and most important object, the multiplication of artificial meadows, to supply the defect of natural ones, for the fattening of cattle; without once venturing to think of suppressing the mode of fallowing the grounds, however far they carried their system of increasing the number of artificial pastures.

This system, which appears the most plausible of any they have projected, and is received with the greatest partiality by our farmers, is, nevertheless, contradicted by the experience of the greatest and the most ancient land-laboring nation in the world, who regard the practice of meadows, and fallowing grounds, as an abuse, destructive of plenty and population, which are the only important objects of agriculture.

A Chinese laborer could not but smile, if you informed him that the earth has occasion for repose at a certain fixed period of time; he certainly would say, that we deviated greatly from the point in view, could he read our treatises, ancient and modern—our marvellous speculations on agriculture. What would he say, if he saw our lands, part of them fallow, part of them employed in useless cultures, and the remainder wretchedly labored. What would he say, what must be his feelings, if, in travelling over our fields, he observed the extreme misery and barbarism of their wretched cultivators?

The Chinese lands, in general, are not superior to ours; you see there, as with us, some excellent grounds, others middling, the rest bad; some soils strong, others light; lands where clay, and lands where sand, gravel, and flints every where predominate.

All these grounds, even in the northern provinces, yield annually two crops, and in those towards the south, often five in two years, without one single fallow season, during the many thousands of years that they have been converted to the purposes of agriculture.

The Chinese use the same manures as we do, in order to restore to their grounds those salts and juices, which an unintermitting production is perpetually consuming. They are acquainted with marl; they employ also common salt, lime, ashes, and all sorts of animal dung, but above all, that which we throw into the rivers; they make great use of urine, which is carefully preserved in every house, and sold to advantage. In a word, every thing produced by the earth is re-conveyed to it with the greatest care, into whatever shape the operations of nature or art may have transformed it.

When their manures are at any time scarce, they supply the deficiency, by turning up the ground with the spade, to a great depth, which brings up to the surface of the field a new soil, enriched with the juices of that which descends in its room.

Without meadows, the Chinese maintain a number of horses, buffaloes, and other animals of every species necessary for labor, for sustenance and for manure. These animals are fed, some with straw, some with roots, beans, and grain of every kind. It is true they have fewer horses, and horned cattle, in proportion, than we have, yet it is not necessary they should have more.

The whole country is cut into canals, dug by the industry of the inhabitants, extending from river to river, which divide and water this vast empire, like a garden. Travelling, transporting of goods, almost every species of carriage, is performed on these canals, with great ease and small expense; they do not even use horses to drag their boats; every thing is done by the sail or the oar, which they manage with singular dexterity, even in going up the rivers. Where any kind of labor can be performed at a moderate price by men, it is a maxim with them never to employ animals. In consequence of this the banks of their canals are cultivated almost to the water's edge, they lose not an inch of ground: their public roads resemble our foot paths; their canals, however, are infinitely more useful than highways; they convey fertility every where, and furnish the people great part of their subsistence in fish. There is no comparison between the weight which can be transported in a boat, and that which can be conveyed in any kind of land carriage; no proportion between the expense.

The Chinese are still less acquainted with the use, or rather the luxury of chariots, and equipages of every kind, which crowd the principal cities of Europe. The horses necessary for these, assembled in thousands in our capitals, consume the produce of numberless acres of our best grounds, which, if cultivated with grain, would afford subsistence for multitudes, who are dying of hunger. The Chinese wish rather to maintain men than horses.

The emperor and chief magistrates are carried through the cities by men, with safety and with dignity; their march is sedate and majestic, it threatens not with danger those who walk on foot; they travel in a kind of galleys, safer, more commodious, equally magnificent and less expensive than our land equipages.

I have before observed that the Chinese lose not an inch of ground. They are very far, therefore, from allotting immense parks, of the finest ground, for the maintainance alone of deer, in contempt of the human race. The emperors, even those of

the Tartar line, have never hitherto dreamed of forming these parks, still less the grandees, that is, the magistrates and the learned: such an idea could never find place in the mind of a Chinese. Even their country houses, and boxes of pleasure, present nothing to the eye all around, but useful cultures agreeably diversified. That which constitutes their principal beauty, is their delightful situation, judiciously improved; where, in the disposition of the various parts which constitute the whole, there every where reigns a happy imitation of that beautiful order of nature, from whence art has borrowed all her charms.

The most rocky hills, which, in France and other parts of Europe, they turn into vineyards, or totally neglect, are there compelled, by dint of industry, to produce grain. The Chinese are indeed acquainted with the vine, which here and there they plant in arbors; but they consider it as a luxury, and the wine it produces as an unnecessary superfluity. They would imagine it a sin against humanity, to endeavor to procure, by cultivation, an agreeable liquor, whilst, from the want of that grain which the vineyard might have produced, some individual, perhaps, might be in danger of perishing of hunger.

The steepest mountains, even, are rendered accessible. At Canton, and from one extremity of the empire to the other, you observe mountains cut into terraces, representing at a distance immense pyramids, divided into different stages, which seem to rear their heads to heaven. Every one of these terraces yields annually a crop of some kind of grain, even of rice; and you cannot withhold your admiration, when you behold the water of the river, the canal, or the fountain, which glides by the foot of the mountain, raised from terrace to terrace, even to the summit, by means of a simple portable machine, which two men with ease transport and put in motion.

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The Chinese nation is capable of the most stupendous works; in point of labor, I never observed their equals in the world. Every day in the year is a working day, except the first, destined for paying and receiving visits; and the last, which is consecrated to the ceremonial duties they pay to their ancestors. An idle man would be treated with the most sovereign contempt, and regarded as a paralytic member—a load to the body of which he made a part; the government would in no manner permit it. How opposite from the ideas of other Asiatics, where none are admitted to any degree of estimation but those who, from their situation in life, have nothing to do! An ancient emperor of China, in a public instruction, exhorting the people to labor, observed that if in one corner of the empire there was one man who did nothing, there must in some other quarter, be another who suffers on that account, deprived of the necessaries of life. This wise maxim is fixed in the breast of every Chinese; and, with this people, so open to reason, he who pronounces a wise maxim, pronounces a law.

From the Genesee Farmer.

CURING CORN.

Farmers the present year have had a fine opportunity of testing the respective merits of the two modes of saving corn by topping, or cutting up by the bottom, respecting which some diversity still appears to exist among those who are the most interested. The frost of the fifth of September was widely and severely felt; and while some adopted the old method of topping, others resorted to cutting up by the ground, and when dried, setting up in small stacks. Either course was undoubtedly preferable to letting the corn stand with the dead tops adhering; but we think experience will convince all who are careful observers, that cutting at the ground, is greatly to be preferred by the farmer who wishes to make as much as possible of his frost-bitten field of corn. We knew of two pieces of corn, owned by the same individuals, planted nearly at the same time, and both equally promising, when their progress was stopped by the frost of the fifth. One of the pieces was immediately topped, and the other was, as soon as possible, cut up by the bottom and stacked. They were both husked a short time since, and the owners assured us, that contrary to the expectation of many who witnessed the different modes of curing, they should get at least one-third more sound corn from that cut up, than from that which was topped and left on the hill.

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Communicated for publication in the Farmers' Register.

AN ADDRESS DELIVERED BEFORE THE AGRICULTURAL SOCIETY OF ROCKBRIDGE, AT THEIR ANNUAL MEETING AT FANCY HILL, OCTOBER 13th, 1836.

By Alfred Leyburn, M. D.

Fellow Citizens and Farmers of Rockbridge:

To-day I feel myself called to the discharge of a duty not a little embarrassing, and the more so to me, because I address many of riper years than myself, and whose experimental knowledge of farming far exceeds mine. The office, however, which I now surrender into your hands, was not of my seeking. With a full knowledge of circumstances, it was your pleasure, on your last anniversary, to elect me your President. As such I now address you. And what shall I say on an occasion like this, an occasion of itself well calculated to generate kindly feeling, and enkindle generous emulation? Shall I begin with the woodman in the forest, and follow him from the clearing of his land to the seeding thereof, through his various crops, and attempt to discuss the different methods of cultivating the same, the time for reaping, gathering or curing, as the case may be—in a word, through the various branches into which the art of farming ramifies? No, gentlemen, time, and much more the presence here of veteran farmers, admonish me to abstain from an undertaking at once so tedious and difficult.

Permit me then, during the few moments I occupy, to call your attention to one principal point, to wit: the use of clover as the sheet anchor of the farmer, and as forming the basis generally of whatever beautiful and comfortable he may have have reared for himself.

Scepticism has had its place in all ages, in moral as well as in physical sciences, in history, politics, medicine, and theology; therefore whatever evidence there may be to sustain a position, and however full and clear that evidence may be as to

the correctness of it; nay, I may say that however self-evident a truth may be, there will nevertheless be unbelief in the minds of some, and an attempt to controvert. It is still however, not a little surprising to hear the clovering of lands denounced by some as a useless, and worse than useless expense—and moreover, a crop of St. John's weed, or a crop of narrow leafed plantain, considered not less desirable than one of clover. For the honor of Rockbridge, however, this sentiment, I have no reason to believe, belongs to her; nor do I believe that such a sentiment can ever find a lodgment any where, to be nursed into more than an ephemeral existence.

Having before me to-day, many who are experimentally acquainted with clover and its benefits, they are doubtless ready to respond to the truth of the adage, as old as true, that the best proof of the pudding is in the eating; and many both present and absent, will sustain me in the assertion, that it is every man's interest, in this region of country, to clover for the sake of his land and its immediate benefit to his crops, as well as on account of the many and great collateral advantages derived from such a system. Clover seed, it is true, is an expensive article, but is, to some extent, within the reach of every man. Seldom is any important revolution of any sort, effected except by some effort and expense, and never was a change so important to the farming interests of a country, as that produced by clovering, effected at a less expense. Every man can buy some seed—if he cannot get much, he can get a little, and with that little, work his way gradually into more. As he sows, so shall he reap, and after one proper sowing, and an occasional visit from his hand-maid plaster, taking care that we do not subject it to the too free operation of teeth and hoofs, the different parts of a farm will have soon swallowed seed enough to perpetuate the clover, provided that a system of farming judicious in other respects, be pursued. With such a system we shall, by and by, have turned under clover and enriched our land so that we may, with propriety, pasture some, whilst the land is still in a state of progressive improvement. The great misfortune is however, that few can resist the powerful temptation to pasture prematurely, a luxuriant clover field. Having undertaken to improve thin land by clovering, and well aware that the earth cries out for a full share of the growth to be returned to her by ploughing in, we would fain yield to a request so reasonable, thus modifying and improving our soil. We resolve with all manliness not to yield to the temptation to eat it down, but will plough it down. Our resolution holds out well for a few weeks, when lo! on coming out in the morning, we see in the corner of yonder fence, a breathing skeleton of a cow, scarcely able to maintain her legs, while her scanty yield of milk is extracted from her—and, on going a little farther, our ears are saluted with the wailings and lamentations of some half famished hogs whose every look and motion bespeaks our kind attention. Our feelings of humanity are thus taxed, and that to a degree more than we can well bear, so that our good previous resolution softly gives place to the more benevolent feelings of the heart. The cows and hogs are mustered, and in due form the attack is made upon the clover field, the stock of horses bringing up the rear, and thus ends the clover system. Not having pursued it long enough to derive its many benefits, it is let go and we relapse into our former state. No more common error exists, than that of pasturing prematurely, and the plan most likely to relieve us from this difficulty, is in my opinion, to reduce our stock to a number barely sufficient for present purposes, and remove the division fences. We may pasture still, it is true, but it will not then be clover alone that is pastured. When, however, the farmer's face is set like a flint for the improvement of his land, in rotation clovering and plastering his fields, leaving them undisturbed by his stock, things soon assume a new and fresh aspect. Those gullied hills so long clad in their habiliments of mourning, and valleys where desolation had so long reigned, are now clad in verdant green, and wear the aspect of joy and gladness—thorns and briers having given place to "grass with reeds and rushes." The stock of cows no longer resemble Pharoah's lean kine, but are fat and fruitful, and the milk-maid bends her cautious footsteps homeward laden with her delicious treasure. Now the faithful horse, when released from his toils, regales himself upon the sweet and tender clover, and is nerved afresh for his accustomed task, asking nothing more of his master in winter, when not at work, than clover hay. Now the wailings of the poor neglected hog are no longer heard, but he finds in the florid clover heads a remedy for all his cares, and hastens on to that rotundity which fits him for the knife.

To my mind, it is perfectly clear that it is the interest of every man, in a region of country like this, to adopt a system of clovering for the benefit of his land, and of his more prominent crops; and it is certainly equally clear, that with this system generally in practice, the country will, with entire ease, raise its own pork. Here, indeed, lies one of the most striking benefits of clovering, and one to which the experience of the last year or two in the pork market, should steadfastly direct our attention. The attention once directed to it, and the experiment fully made, my word for it, there will be no looking back, or sighing for former habits. In the spring season the hogs enter the clover field and there remain until after harvest, at which time they are introduced, in good order, to the stubbles, fattening fast upon the shattered grain, and, when done with this, return again for a short season, to the clover. The hogs for the slaughter, being already in good order, have a speedy transition from the clover field to the pen, and a comparative easy one, as regards the owner's corn crib, from the pen to the hands of the butcher. The stock hogs, after having used up the shattered grain, and whatever mast may be in our enclosure, (the frost having now closed the clover season,) are assembled in or near the farm yard, and thus entering the winter in good order, will be carried through it with very little expense, provided the stock of hogs be judiciously selected. I have reason to believe, moreover, that for hogs closely penned, clover hay cut somewhat green and salted, will of itself be sufficient to sustain them pretty well through the winter.

There are those present to day, who have tasted and tried the various streams of comfort flowing out of this system, and where is the man who after having fairly tried it, is ready to give it up? As soon almost would the right hand of that man

"forget its cunning" as that he should abandon a system which makes his barns to overflow, his horses, cows and hogs, to multiply and be fat, and the whole face of nature to smile around him.

Permit an humble individual, therefore, to urge those who have not already done so, to at once adopt this system, so delightful as well as profitable; and endeavor by the use of clover, with plaster and manure, to make their lands progressively better. producing from "thirty to sixty and even a hundred fold."

For some years past, the wheat crop, on which we principally depend for profit, has suffered greatly from two causes, viz: the Hessian fly, and hard freezing. As a means of resistance to the fly, I believe that nothing can be relied upon but strength of soil, and that but imperfectly. Here then should be a powerful additional incentive to clover, and to the use of all means at all likely to give vigor to the soil, and thus fortify, to some extent at least, against the ravages of this fell destroyer and stealthy robber. It can, however, afford no sort of protection against the evils of hard freezing: to this case "human wit and reason are inadequate. To him, and to him alone, "who holds the winds in his hands" are we to look for relief.

Your calling, gentlemen, is pleasant, honest, honorable, and when properly pursued, profitable. Let me then, in conclusion, beseech each one of you to use every exertion to make it still more pleasant, honorable and profitable, by giving to it an enlightened attention—by a free, frequent and generous interchange of opinions—by zealously advocating, and carefully cherishing such publications and institutions as are likely thus to renovate and make happy our beloved country.

From the Silk Culturist.

GREAT INCREASE, AND VALUE, OF CHINESE MULBERRY.

Fredericksburg, Virginia, October 10, 1836.

F. G. Comstock, Esq.

Dear Sir,—In your September number, you have "hit the nail on the head" in your editorial on the acclimation of the Morus multicaulis, from the testimony of the Secretary of the Horticultural Society of Antwerp. The method to which I refer is cutting down the tree, every year, in the fall, to within a few inches of the ground. I have had experience on that point, this year, though my object was not to acclimate the tree. We have none, or but little winter to contend with here. Whilst on this subject, I will detail all my experience with the multicaulis—for you know that if I lived in Maine, I would not give you a fig for all the white and other mulberry trees, for the purpose of feeding silk worm, in Christendom.

In April, 1835, I purchased of an agent of the Messrs. Prince, 75 trees of the morus multicaulis, which I set out, about two feet apart each way, in a moist loamy soil. They averaged about two feet in height, and half inch in diameter at the butt. By this fall they had put up, on an average, six branches about five feet high. In the spring of '36, as soon as I could find a bud swollen, I cut all the branches down to within six inches of the ground. These I cut up into pieces about eight inches long, having two buds on each cutting—amounting in all to upwards of five thousand cuttings. These were stuck in prepared ground to one half their length—one bud in the earth, and one bud out—and I am sure I have not lost five per cent. of them, and many of these cuttings are now six feet tall, and an inch in diameter at the butt.

But the 75 stocks which were cut to the ground have attained the average height of eight feet, and a dozen branches somewhat lower, and are bending beneath the heaviest growth of foliage I ever saw. I had, the other day, a few moments conversation with a gentleman just returned from Europe, and he informed me that it is the practice of the farmers in the mulberry countries, through which he travelled, to cut the trees down annually, not for the purpose of acclimating, (which I have no doubt will serve a good purpose in New England for that object,) but for the purpose of producing a *tender* and *abundant* foliage.

To sum up, the reader will notice the facility with which the multicaulis can be propagated. From 75—5.000 in 18 months—one fourth acre of land—$12.50 first cost, and $5 worth of labor bestowed in cultivation. I am fully persuaded that the multicaulis is decidedly the best tree for feeding the silk worm; and that 8 or 10 by 2 or 3 feet, is the most convenient distance, and that the trees should be cut down every year to within a few inches of the ground.

Respectfully,

J. B. GRAY.

Notes by the Editor.—1. We hope our friends in Maine, will not be deterred from prosecuting the culture of silk by the remark of Mr. Gray. It must be remembered that he is a Virginian, enjoying a climate peculiarly mild, and an air remarkably congenial to the growth and labor of the silk worm. It is also probable that he has no personal knowledge of the climate of Maine, and, like all others who have not visited that state, supposes it to be a region as cold and dreary as Lapland or Iceland. From personal observation, we are convinced that the growth of silk may be pursued to advantage in most parts of the state; and the results of late experiments have also settled the question beyond a doubt, that both the mulberry and the worm will live and thrive in the 45th parallel of latitude. The silk is also of a better quality than that grown in warmer climates.

2. The ratio in which Mr. G. has multiplied his trees is truly astonishing, and the profits he must have derived from them is equally so. He has given the time he has been engaged in the business, the stock with which he commenced, the cost of trees, labor, &c. and the number he has now on hand;—to which we will add their present value, that the reader may have the whole subject before him. Trees of the size and height he describes are worth fifty cents a piece in market, and would be purchased in New England at that price as soon as offered. The present worth of his 5,000 trees is therefore $2500—an enormous sum to be derived from an investment of $17.50 in trees and labor in the short term of eighteen months. These, it will also be noticed, have been produced on *one fourth of an acre of land.* We leave the reader to compute the number, and their value, which an acre would produce in the same proportion.—Ed. S. C.

From the (British) Quarterly Journal of Agriculture.

ON THE EXCRETION FROM THE ROOTS OF PLANTS.

By Mr. Towers.

It may appear superfluous to recur to the subject of secretion and exudation from the roots of plants; but as numbers seem to doubt, and observation and experiment are regarded as little better than theoretic hallucinations, I feel it right to enter the lists once more. M. De Candolle founded his hypothesis upon philosophical deduction; M. Macaire experimented and tested chemically; I reasoned from observation, and still believe I was the first who, in our own country, placed the theory before the public grounded upon the evidence of comparative observations. I, in 1829, knew nothing of the hypothesis of Geneva, and had met with no observations upon the phenomena; but I listened to the remarks of practical men, of gardeners, cottagers, and intelligent domestic cultivators. I observed for myself, and, without looking into the laboratory, or applying any non-natural test or re-agent, arrived at and stated those opinions which I published in the "Gardener's Manual." So much I may be permitted to say, in answer to those objections which have been made in reference to the operations of the laboratory. Prospectively, I shall observe once for all, that, much as I prize experimental chemistry, I witness and read of so many factitious results, when subjects *endued with a vital principle* are acted upon by chemical powers, that I have desisted, and mean to desist, from any attempts to derive irrefragable evidence from chemical tests, and now base my opinions solely upon the facts resulting from observations of vegetable phenomena.

That excretions really are made, there appears to be no rational ground to doubt: no one, I think, can go through a course of gardening operations, without becoming assured that the soil in the field, the garden, and in pots, containing plants, becomes replete, sometimes to saturation, with specific products. I may mention one fact which has just occurred. I observed that the roots of a young plant of *Tropæolum atropurpureum*, Lord Auckland's dark-colored nasturtium, had protruded from the hole in the bottom of the pot. The size of this pot is what we here style a 48; it measures about four inches internal diameter. On striking out the ball, I was astonished to perceive the extremely powerful odor which was emitted. The roots had completely worked themselves around the pot, the fibres were matted, but the whole mass was pungent, as if a quantity of water-cresses had been bruised and applied to the nose. In potting, a great variety indeed of peculiar odors are discernible. *Heliotropes* yield a powerful and almost animal scent; all the *Justicias* a stale and fœtid vegetable effluvia; coffee, one of rather a leguminous character; but that of the *Tropæolum* was peculiarly pungent. I could enumerate a great many potted plants which yield very distinct odors from the ball of roots, that are quite undiscernible till the plants are removed from the pots; but I desist, as the experiments may be tried by every one.

I wish, in this place, to meet an objection which may be started against the evidence of odors adduced above; it is this. We admit, many may say, that soils about the roots of plants, whether they be confined to pots, or free in the open plots of the garden, emit peculiar odors; but do not these arise *from the roots themselves*, and not from matters exuded by them, and dispersed among the particles of the soil? I am prepared to grant that the roots, as well as the flowers of a vegetable, may possess specific aromas, but these cannot be diffused unless they be first emitted; the fact of diffusion, and that to an extent which renders them perceptible at the distance of many inches, or even feet, is demonstrative of the hypothesis of exudation—that which is disseminated must be first given forth: this admits of neither hesitation nor doubt.

If, then, the ground be embued with odorous matter transmitted by the porous system of the roots; or if it be admitted, that the odors arise from the very substance itself of millions of fibres, broken off, and retained by the soil, which cannot by any art be separated from it, the argument is still one and the same; for it is a matter of pure indifference (provided the ground become saturated with any specific substance) whether that substance be gaseous or solid, whether it have been transmitted from the plant, or produced by admixture with broken and lacerated portions of the vegetable body itself. Not to weary the reader with arguments upon a subject which must be self-evident, I shall close my present remarks by observing, that I build my hypothesis much more upon the phenomena of vegetable life and growth, that is, upon natural facts, than upon the results of chemical experiments; and I shall shortly adduce a very closely pursued experiment of a compound nature, in order to establish the fact, that *chemical agency ought* not to be *employed* with *substances endowed with the vital principle*, and that the inferences deduced from experiments upon living vegetables placed in unnatural situations are frequently founded in, and lead to error. Dead matter, mineral substances, and the like, are the proper subjects for chemical analysis; upon them its power can be legitimately brought to bear. The living being is embued with powers peculiar to itself; it is subjected to laws that govern its mode of existence; all its phenomena are indeed dependent upon a specific vital energy: hence we cannot with safety attempt to arrive at definite conclusions from the operation of agents which interfere with and destroy that energy. M. Macaire's experiments are conclusive as far as they go; his ingenuity, and the zeal with which he followed up its dictates, are highly to be applauded; but the experiments which I above alluded to, will, I doubt not, afford proof, that *nature must be investigated in her own way*, and that he who assails, instead of consulting her, will of necessity become embarrassed by perplexing and contradictory results.

That which led me, in the summer of 1834, to undertake my very protracted experiment, was the assertion frequently met with, that the *sap-vessels of plants had been, and might be again, made manifest by the agency of chemical tests.* I had long doubted the correctness of this assertion, and therefore determined to bring the matter to immediate issue. Conceiving that the *balsam (Balsamina hortensis)* presented the readiest means to effect my purpose, because of its rapid growth, juiciness, and great transparency of stem, I selected three cuttings from a plant of nearly the same size;

they were about three inches long; being placed in a bottle of water, and in the stove, they all emitted roots in a very few days. When these had grown an inch or two long, I raised each plant without injuring a fibre, and planted them in three small pots containing the simplest loam I could find: I mean, by this term, a loam free from any foreign manuring substance. The plants were potted at the same time, watered with clear water, and set in the stove to revive; in fact, they never drooped, but quickly establishing their roots in the loam, began to grow. Intermediately, two solutions were prepared, one of *sulphate of iron*, brought to the state of *peroxide* by the addition of a few drops of nitrous acid; the strength of this liquor was so considerable, that the tongue could not conveniently support its astringency; one-fourth of a fluid drachm, a saturated liquor of the peroxide, being added to four ounces of rain water. The second solution consisted of a drachm of powdered Brazil-wood, digested in four ounces of boiling rain water, strained when cold, and tinged an intense crimson purple by the addition of a few drops of pure *(i. e. caustic)* potassa liquor.

The three plants were then treated in the following manner—One was marked "water," the second "color," and the third "iron." To the first, pure rain water only was applied, to the second, the extract of Brazil-wood, and to the third, the solution of iron.

The experiment commenced at the end of July, and was continued till the 17th of August. The plants were always moistened in the way pointed out, with the simple exception, that, once or twice, when a powerful heat had quite dried the soil of the two balsams artificially treated, a little pure water was given to restore its proper texture. The reader is requested to notice particularly the results now to be stated. The first, marked "water," was healthy, and had grown to the height of a foot; had it been in rich soil, and even in a pot of moderate size, it would have been much larger, but the three were retained in the smallest sixties, that is, in vehicles scarcely two inches wide at the top.

No. 2, with solution of Brazil-wood, was not quite so vigorous, but it was nearly as tall and healthy as No. 1. No. 3 was also healthy, but not so tall, and it contracted a slight curve in the stem. The soil of No. 2, became almost as black as ink; that of No. 3. had all the appearance of mere rust.

Now, if the roots of plants while in a natural state, living and growing in soils, really absorb chemical or vegetable fluids, it ought to follow, that the solution of Brazil-wood, having entered the sap-vessels, would yield a dye of black on the application of a solution of green sulphate of iron. To ascertain the fact, I placed a minute drop of the Brazil liquid on a piece of white paper, and applied to it a little drop of the solution of iron, and the formation of ink instantly proved the delicacy and correctness of the test. I then cut a slice from the stem of the balsam (No. 2,) and, having a microscope at hand, examined it, and the stem in every way and direction. I called in a witness, one whose eyes were acute in all botanical investigations; no trace of coloring matter could be discovered, and the iron test produced no effect or discoloration whatsoever. Hence it may be asserted, that the living roots of a balsam, with a white stem, had not taken up the thousandth part of a fluid drop of the coloring matter of Brazil-wood. No. 3, was then investigated, and the detached portions examined in every way, yet no trace of yellow was perceivable. If water, diluted with even one hundredth part of a solution of peroxide of iron, be tested with prussiate of potassa *(hydrocyanate of potassa,)* a blue shade more or less intense will be the inevitable result. This test was rigidly applied, and not a tint of blue, in vessel, cell, or fibre, could be discerned. Hence it was fair to conclude also, that the living balsam, *in mould*, could not take up the slightest quantity of iron. To make assurance still more sure, two other balsams were tested, one—a rooted plant—was taken from the water without injuring its roots, and placed in a solution of peroxide of iron of the strength described; it was killed almost instantly, and fell withered over the side of the glass vessel. The other was an unrooted cutting. I placed it in a decoction of Brazil-wood, and, so far from striking roots therein (as it would have done freely in water,) it became sickly, and died in a day or two.

I draw two important inferences from these experiments: the *first* is, that plants naturally situated, have, by the agency of their vital principle—be that what it may—a power to select and absorb appropriate food; but that the ground may be so saturated with vicious or unnutritious matters, as to prevent the secretion of a due supply of aliment. *Second*, that the true sap-vessels act only while the plant remains undisturbed, and in its natural bed. Persons accustomed to vegetable dissection, have flattered themselves, and indeed asserted, that the vessels may be detected by placing cuttings in colored infusions. Some have also said (and this is a tacit admission of a weighty fact,) that if *rooted* plants be placed in such infusions, &c. they will *absorb, provided the roots be first cut through* near their points. It appears to me certain, that all investigations conducted with mutilated subjects, such as cuttings, slips, wounded roots, and the like, tend to mislead the judgment, and to falsify the inquiry. I do not venture to assert that there are no *exceptions;* but I hesitate not to say that plants in health, living and growing in soil, will not absorb artificial, innutritive substances; they elaborate and secrete; and the soil is to them an appropriate medium, an adjunct of great consequence, through the texture and composition of which they are enabled to carry on the processes which are essential to their being and support. All mutilations are just so many sophistications, and the inferences deduced from the phenomena they afford, tend to error and false philosophy.

That it may not be thought I have introduced a recital which applies to an inquiry into the arrangement and *offices of the sap-vessels*, rather than to one on *radical excretion*, I must add, that the experiments, though directly bearing upon the question of the conducting vessels of plants, leads us to a just appreciation of the value of chemical experiments, when performed upon living beings. We perceive plainly that plants, if growing in soil, have a power to reject substances that become utterly destructive when they are applied to the naked and unprotected roots; hence we ought to be very cautious before we receive, with implicit faith, those hypotheses which may be founded upon phenomena produced by chemical agents upon plants artificially situated. I respect the mo-

tives of M. Macaire, and highly value his experimental labors, which at one time, appeared to me, to be so comprehensive, that I partly determined to undertake a series of a similar nature. However, when I witnessed the results of my own investigations, and reasoned upon the diametrically opposite effects produced by the same agents when applied under varying circumstances, I resolved to rely upon the observation of natural phenomena in my endeavor to substantiate the theory of the excretory powers of plants. If, *when in soil*, they absorb nutritive matter, and reject poisonous substances; and, on the other hand, if, when taken from the soil or from water, with their roots in perfect health and security, they die at once, or dwindle away, *when immersed in those very fluids* which are *innocuous* to them as long as their roots are surrounded by earth; then, I think it perfectly fair and rational to conclude, that *no certain unerring deductions can be drawn in respect to the quantity or quality of the radical excretions*, from observations or experiments made upon plants, *the naked roots of which are immersed either in water or in chemical fluids.* Beans, wheat, pease, and other vegetables, have germinated in water, and matters have been emitted by their roots, which afforded certain given results, on the application of chemical tests and re-agents; but I would inquire, can any one venture to suppose that the plants thus grown, were in a truly natural situation? were they excited as they would have been in soil? were they similarly acted upon by the great natural agents, *light, air, water?* Surely not! The grand medium of elaboration—that which connects the fluid of the plant with those in the ground which sustain and nourish it—was absent; in a word, *earth and soil were wanting;* and as without these, not one vegetable being in a thousand, can increase and attain maturity (although many will strike roots in simple water,) it is unphilosophical to conclude, that the vital functions of any plant can be perfectly carried on in media which disqualify it from attaining its full growth, and entire development of parts. Let us pursue inquiries; let us add fact to fact, and also adduce analogical reasons from observed phenomena; but, at the same time, let us be exceedingly cautious how we apply or draw conclusions from the application of an agency which is opposed to nature, and subverts the natural functions of a living subject exposed to its influence.

Upon mature reflection, then, I cannot conceive that the vegetable secretions, which are phenomena dependent solely upon the vital principle and natural stimuli, will ever be discovered or made manifest by the agency of chemical tests and experiments. That these secretions, however, are effected by the radical processes of vegetables, can scarcely admit of a rational doubt. As a chemist, I may be thought to lose sight of, and prove false to, my early profession; but I make no appeal to chemistry, otherwise, than as it enables me to experiment upon tractable substances, and thus to deduce legitimate inferences. I love it as a science, but must repeat my conviction, that we can derive very inefficient aid from the laboratory, when we wish to scrutinize the energy of life; all therein is wrapped up in mystery, which the mind and art of man can neither approach nor unravel.

If, however, we look at a bed of maiden loam, test it *chemically*, and then plant it with successive vegetable crops, we shall perceive a gradual change in the color of the soil. *This is one main fact.* The assured experience of the benefit derived from a *change of crop*, affords another; and the advantage of a certain order of rotation yields us *a third.* To these facts we may add, the particular aroma that the earth receives; for, though there may be exceptions and many shades of difference, yet we cannot fail to recollect proofs of the emission of certain odorous matters highly characteristic of the vegetable with which the ground has been cropped. To these natural phenomena we must have recourse; and in so doing, if we collect all the evidences which are in the power of any active mind to observe, we shall, I believe, find strong analogies in proof, not only of the theory in question, but of another grand philosophical fact, namely, that *vegetable beings never exhaust a soil*, that the densest sward of grass adds vigour and power to the earth of the meadow, and that weeds—poor despised weeds—unsightly as they appear, are not only harbingers of plenty, and prove the goodness of the soil they so speedily and unaccountably cover, but add riches to it, and a fund of nutriment for other and more refined crops. Let us turn our eyes to the scarcely half-weeded garden of the cottager, and compare the enormous crops of bulky cabbages, healthy sound potatoes, onions, &c. with the comparatively poor and dwindled produce of a more wealthy neighbor, whose garden is seldom permitted to be disgraced by the presence of an unsightly weed. Let me not, however, be misunderstood. I am an advocate for cleanliness, industry, and order; and I know that native weeds may overpower a crop, and deprive it of solar, electrical, and ærial influences; but do not let us be so unphilosophical as to suppose that these sturdy natives *impoverish.* All we have to do is to watch their progress in the garden and the field, and never to suffer them to become masters. It is the duty of the farmer and the gardener to hail the presence of weeds as an evidence of a fertilizing principle, and then, by watchfulness and industry, to convert them to manure. But I shall not enlarge on this subject now.

REPORT OF THE ENGINEER OF THE EASTERN SHORE RAIL ROAD.

Washington City, November 10, 1836.

To the Commissioners appointed to survey the route of the Eastern Shore Rail Road:

Gentlemen,—Of the various surveys which have been made under your direction for the purpose of ascertaining the best route for a rail road on the Eastern Shore of Maryland, conformably to the several acts and resolutions of December session, 1835, the one which I have selected as the basis of the preliminary estimates, begins at the Wilmington and Susquehanna Rail Road, near the town of Elkton, and continuing throughout its whole course within the state, crosses the Chesapeake and Delaware Canal a few hundred yards west of the pivot bridge, and after passing a little to the west of the head of Bohemia and Sassafras Rivers, thence by the head of Chester or Millington, and the head of Choptank or Greensborough, and by the North West Branch, eastward of the Bloomery, to the Nanticoke River, which it crosses between Sharp-

town and the Delaware line. From the Nanticoke, it follows a very direct course to Princess Anne, whence it diverges south-westwardly to the mouth of Little Annemesic River, on Tangier Sound, its terminus. Its total length is 118¼ miles.

The purpose of this communication limits me very cursorily to remark, in relation to the character of the line, that for lowness of grade and directness of communication, I know of no road of its length by any means comparable to it. The grades rarely reach, and never exceed twenty-one feet to the mile, and this only, on very few miles of its length in Cecil County, and at the crossing of the principal water courses. On much the greater part of the route, the grades do not attain one half that rate per mile.

Between the points of passage of the rivers above named, the lines were intended to be traced perfectly straight, and so far as this was practicable in an experimental survey, it has been done. They are very oblique to each other, and the curves by which they are to be connected, need in no case be of less radius than one mile, and for nearly one hundred miles of the route, very probably of not less than five miles radius.

The annexed estimate is founded, on the facts collected during the experimental survey, and although it was not supposed that this would follow the best ground, the stations were nevertheless taken at 300 feet apart, where the surface of the country was nearly level, and at 200 feet or less, where it became undulating or broken—this is mentioned to show that the quantities stated in the estimate, are not assumed without careful inquiry. The other elements of the estimate are as follows, viz. the road-bed to be formed for a single track, except at the embankments, where it is to receive a breadth of 20 feet at the crossing of the principal creeks and rivers. The viaducts to be of the best timber, and to have a breadth of 20 feet of flooring. The rails to be of 2¼ by ⅝ inch iron, resting on wooden string pieces, 6 by 6 inches, and 10 by 12 inch sleepers, all of the very best quality. The cost of materials and workmanship generally are assumed at the highest current prices, and wherever in framing the estimate of road-bed and bridges there was a doubt as to quantity or value, the sum taken was a maximum, and the price of the iron is that for which it is offered by a most respectable house. I am warranted, therefore, I think, in assuring the Commissioners, that the amount of the estimate need not be exceeded in the construction of the road.

Ample provision it is believed is also made for the transportation upon the road, and for connecting it with the great stream of southern travel, which seeking its way to the north will find this in connection with the ports of Norfolk and Portsmouth, and with the rivers of the south-western part of the Chesapeake Bay, a safe and convenient as well as a very *expeditious*, and at all times too, an *uninterrupted* channel of communication.

In the present state of our statistical information we are unable to present other than general views of the business which may be expected to come upon the road. It is, however, mainly to the transportation of passengers, that this, as well as all other railways, not directly in connection with great mineral regions, are to look for profitable returns upon the capital invested, and it is to this source the friends of the road may with the most undoubting confidence turn themselves.

From the southern seaboard, the country bordering on the Gulf of Mexico, the lower Mississippi and its tributaries, and from all the country which lies south and south-west of the states of Virginia and Kentucky, the number of travellers who annually seek the north in pursuit of business, of health, or of recreation, and who again return back upon the south, is absolutely incalculable; along the navigable water courses, they are seen to crowd the numerous steam boats, and on the seaboard, the packet vessels are fully occupied. During the boating season, the travelling from the south and south-west is almost altogether by steam boats, notwithstanding the acknowledged danger and delays incident to this mode of journeying, west of the mountains. When this season is past, the traveller has no other course, whether he proceeds to the north or returns southwardly, than to take the ports of the Gulf, or to cross the mountains, and journey by the valley of the Tennessee, and thence home. The latter course is often preferred, and the number of travellers, and the quantity of goods also by that route, often greatly exceeds the means of conveyance. Nearer the seaboard, the condition of the traveller upon the road is not more enviable, and the voyage by the coast is beset with some danger, and much discomfort. Conscious of this condition of things, the intelligent men of the south and west are using every effort to awaken and direct enterprise. From the Gulf of Mexico, roads are in contemplation, or are already undertaken, the prolongation of which, must be through the principal towns of the interior of the states of Georgia and the Carolinas towards the western termination of the Portsmouth and Roanoke Rail Road. With these projects are and will be connected, others to lead to the commercial capitals of those states, and from the Mississippi, others will proceed by the way of Georgia, by the valley of the Tennessee, or more directly by Knoxville, and all them uniting with the great line of communication which I have just mentioned, all of them directing themselves towards the Roanoke. By the valley of the Roanoke also, and of one of its tributaries, a rail road which has recently been surveyed, will be conveyed to the same point, the agricultural and mineral wealth of an extensive region, and will return to it the merchandise which it will consume.

It is ascertained that the travel last year between Charleston and Savannah, and the northern cities alone, amounted to between 50 and 60,000 passengers. The contemplation of this great number is alone sufficient to convey to us some idea of the multitudes who throng to the north, from the vast regions of the south and west, the greater part of whom, undoubtedly, would prefer to travel by rail roads, and who, as I have shown, would be conducted by them directly towards your road. Whether, on arriving at the Roanoke River, the choice being before them of the route by Richmond and Potomac Creek, by Norfolk and the Chesapeake Bay, to the Frenchtown Rail Road, or of your road by the bay and peninsula, is a question, which the friends of the Eastern Shore Rail Road will willingly leave to the decision of the traveller. That the general preference would be given to the convevance by rail roads over that by sea, or by the Mississippi and Ohio rivers during the boat-

ing season, or to the mountain roads at any season, cannot admit of doubt.

I have not yet arranged the data by which may be shown the great advantage which the road offers for the rapid transmission of intelligence, and its consequent connection with the transportation of the mail. What I have already said, while speaking of the experimental survey and of the grades, is, however, sufficient to enable the Commissioners to perceive the necessary connection which it must have with this source of revenue.

Situated as the south-western terminus of the line is, in a climate comparatively mild, the navigation of the waters near it, are rarely closed, and never certainly so much obstructed by ice as to present serious difficulty in keeping it free to vessels arriving on our coast, especially from the south, and destined for a port inaccessible by reason of the inclemency of the season, Tangier sound and the neighboring waters, always easy of access and safe, offer sufficient harbors and anchorages in near connection with the road, and capable of being brought in direct contact with it. The advantage, therefore, which it presents of an occasional winter-harbor for merchant vessels, and the facilities which the road presents for the conveyance of their cargoes to their proper destination, are, I conceive, of no inconsiderable importance, viewed either in relation to the interests of the Eastern Shore, or to those of the commercial cities of Baltimore, Philadelphia and Wilmington.

I have already, gentlemen, exceeded the limits which I had assigned to this letter, and must, very reluctantly, pass over a branch of the subject not less interesting, nor less fruitful of mutual advantages than those I have already spoken of; I mean the benefit which this improvement is likely to receive from, and to confer upon the country through which it is proposed to carry it—its connection with the agricultural improvement, and the general amelioration of the condition of the peninsula. These and other topics must be reserved as subjects to be considered in a general report hereafter to be furnished.

The plans and profiles of the ground, and of the several parts of the work, and the details of the estimates, are already prepared in the rough form, and will be in readiness to accompany my report, on which also some considerable progress has been made, should it be in my power, as it has been certainly my desire to complete it. Of this, however, I have no expectation, as I am under orders which separate me from this duty, the moment my health is sufficiently re-established to permit me to travel. The general report which may be somewhat voluminous, and will embrace much detail, will necessarily occupy some time in its preparation; but it can be ready quite soon enough for any purpose for which the Commissioners may have occasion to use it.

It has been my intention also to give plans and estimates for the eastern line as far as it has been surveyed, and of the route which, on separating from the one on which the annexed abstract of estimate is founded, at or near the right bank of Sassafras River, would cross Back Creek at Chesapeake City, and pursue thence the most favorable ground, would cross Big Elk River, at or immediately west of Elkton.

The survey of the ground over which the Branch Road, south of Princess Anne, leading to the Virginia line, with the intention of uniting hereafter with the Virginia Road to Cherry-Stone, has been completed so far as the compass work applied to it. We are, therefore, enabled to assume the length of the branch, and this, together with the striking resemblance which much of it bears to the ground over which the levelling was carried for the location of the main stem near Princess Anne, enables me to give an approximate estimate for this branch, and which will be sent to the commissioners whenever they may desire it.

The lateral roads contemplated to be surveyed under the resolution of your Legislature, No. 108, it has as yet been impracticable to survey, but their location, I presume, will be made at as early a period as possible.

I have the honor to be,
Very respectfully,
Gentlemen, your obedient servant,
JAMES KEARNEY.

Abstract of an estimate of the cost of the main stem of the Eastern Shore Rail Road, of 118¼ *miles long, and of the cost of a steam boat line from its south-western termination, near Tangier Sound,* 85 *miles to Portsmouth, in Virginia.*

For the road,	Dolls. Cts.
For 1,129,076 cubic yards, excavation and embankment,	263,892 27
For clearing and grubbing,	11,397 00
For bridges and culverts,	120,928 00
For sleepers, string pieces, wedges and iron for superstructure, and for crossings and sidings,	302,034 50
For depots, water stations, wharves and fencing,	70,000 00
For purchase and condemnation of land,	21,500 00
	$945,773 77
Contingencies at 12 per cent.	109,754 85
Total cost of the road and its appurtenances,	1,024,378 62
For locomotive engines, and for passengers' and burden cars,	81,000 00
For two steam boats,	150,000 00
Total estimate,	1,255,378 62

November 10, 1836.

FARMING ON THE RIVANNA. CORN CULTURE—CLOVER—MANURING.

To the Editor of the Farmers' Register.

November, 23d, 1836.

Admonished twelve months ago, as well by a sense of duty, as by repeated calls on the subscribers to your valuable journal, for practical communications—I then devoted part of a rainy day to giving to it a modicum of my experience. But unwilling to obtrude my opinions on the public eye, sharp-sighted as it had become from light recently shed on your paper by a discussion among some of our most distinguished agriculturists, I declined offering my meager essay at so inauspicious a period. *Another rainy day*, however, and the annual business of arranging papers, force it

on my notice, and I fear you will have cause to regret that there are not still combatants on the arena, from whose observation I might willingly hide my diminished head. And yet, having made agriculture my profession from the outset of a business life of more than twenty years, I feel more unwilling to acknowledge ignorance than to expose, as I may do, the imperfections of a practice, which has not been without its success. Not entering on the wide field of the vexed question of *rotation*, further than it must necessarily be involved in the tendency of my remarks, I shall content myself with defending *that* which I have practiced for 15 years--avoiding any attack on other systems; and thus, Mr. Editor, I hope to escape the ungloved handling to which a different course might subject me.

Although standing under the shadow of a name which would give but little weight to the manuscript that has so long laid on the shelf, I still feel a repugnance at the egotism of entering so minutely and personally into details that may afford little, or *no* benefit to your readers—and therefore, as *some apology*, (though at additional expense to your columns and *their* patience) have ushered it in with this exordium.

It is not unimportant to mention that four fifths of the arable lands of the farm which is the subject of this communication, consist of what is denominated, above the falls of James River, first and second lowgrounds, which being level or gently undulating, with generally a deep soil, admit of the advantageous use of four-horse ploughs--not admissible on rolling, or shallow lands. This farm was put under a three-field course in the autumn of 1832. Field No. 1. being then sown in wheat was laid down in clover, for *the first time*, in January following. Nos. 2 and 3 taking their rounds in corn, &c. wheat and clover, it will be seen that No. 1, comes under cultivation for the crop of 1835. The clover having been very fine, without a hoof, and scarcely a scythe put into it, the land was in a condition to give its best return.

As in the preparation for, and cultivation of the corn crop, it involves many of the details of the three-field system, and from its intrinsic value and the labor usually expended on its culture, constitutes as important an item in Virginia husbandry as any other--I will submit my plan of managing it through all its stages.

The above field, (No. 1.) was laid into beds of 14 feet width, by four-horse Loudoun bar-shares, carrying furrows from 8 to 12 inches deep, (according to depth of soils,) and 17 wide. The corn, and tobacco lands being selected, as well for their fertility as level surface, on account of the liability of broken lands to *wash* in hoe-crops, were first ploughed. This being done before the new year, they were put in the finest tilth by the agency of frost, assisted by the opening effect of a clover ley and deep ploughing, with its necessary adjunct, cross-draining, by *deep-grips*.

As soon in March as it is *perfectly* dry, the cornfield is harrowed diagonally across the beds with heavy wheat-drags. At the time of planting, when the earth is warm and buds begin to spring, (regardless of dates,) the same drags are passed three times lengthwise the bed—three rows being laid off on each, with a single mould-board plough, carrying a clear furrow from 2 to 3 inches deep. The seed corn having been steeped in liquor from the farm-pen, one night, and rolled in plaster the following morning, is dropped by hand, from 4 to 6 grains in a place, (as I am opposed to re-planting,) at the distance of eighteen inches. It is then covered with an implement—being a frame with two coulters placed side by side—the frame so closed as to bring the coulters *just* within the laying off furrows. This raises a slight list over the grain which prevents the taking effect of the hasty rains, and acts as a cultivation. Hoes follow after, brushing off the clods that may be left on the list and covering exposed grains. When the corn is about six inches high, single horse mould-board ploughs are introduced—commencing their operation in the middle of the balk with the bar next the corn, flushing the whole and finishing as near as they can be gotten to the row. A coulter follows in this finishing furrow, with the foot of it so turned under, as to move every plant in passing. Then come the hoes trimming down this narrow ridge, and thinning to one stalk, except where there are missing hills, in which case, leaving two or more stalks to make up the deficiency. I also leave two stalks in every alternate or third hill, in extra rich parts of the field. As soon as the stalk will bear a heavy earthing with the same ploughs, the balk is thrown back. On account of leaving the field in the dryest state for wheat sowing, I give the water-furrow rows 5 feet distance—*laying by* the three last furrows with a two-horse mould-board plough. This operation finishes the working of the field. My reasoning on which practice is, that a heavy clover ley being made by four-horse ploughs, beyond the reach of disturbance from the smaller ploughs, or the deleterious influence of the sun, affords a rich moist pasture for the roots of this greedy and thirsty plant, which I have observed, will maintain its color in *almost any* drought, on this system.

I would not recommend beds of 14 feet width on *wet* lands—nor do I think them as suitable for corn *alone*, as narrower beds with two rows, as the middle row has the advantage of the others, and will *keep it* throughout its growth. But for wheat and clover, I give that width the decided preference. In ploughing such beds for wheat, after corn, they cannot be reversed with fewer than four horses, without leaving them too low in the middle. I therefore *raise* them with two, by first throwing out the corn stubble of the inside row, with a wide furrow, then filling it by running *wide* on each side; this gives to the beds a handsome arch, without leaving them too high.

To return to the corn crop, however, I housed from fifty nine acres of the low ground division of the first field, (which is inferior to a large proportion of the second low grounds of the same,) 740 barrels of sound and large ears—the average yield being reduced, by the balance of that division having been taken off for tobacco, which requires the richest land. The advantage to the crop of corn from further working than is here stated, would, I think, be trifling; yet on account of the succeeding wheat crop, I would give about harvest, or immediately after, a *very shallow* brushing over with cultivators or hoes. But having under my system *full* crops of corn, tobacco, and oats, besides timothy meadows, all pressing at that season, it would certainly be injurious to bestow more labor on *that one*. In commendation of a

clover ley with deep ploughing and efficient draining, as a preparation for corn, let me say that my predecessor told me after the above mentioned result was ascertained, that the same field, when I became possessed of it three years before, would not have yielded more than five barrels per acre. He too is a manager of high reputation; but had not enjoyed (having been an agent) the advantages of clover and its indispensable adjunct, *plaster*. These, with the exception of a thin top-dressing of *stained* straw on, perhaps, two acres of land in the same field (which had been abraded by freshets,) when it was in wheat, constituted the only manuring of the field. Although this teeming production cannot justly be charged, in the *first* rounds, to the three-field course, it certainly speaks loudly in favor of the rotation of corn after clover, particularly, when the succeeding wheat crop (of this year) was better than has been generally obtained this season. As to the result of a fair experiment of the system, I can only say, "*nous verrons;*" but must be permitted to add, that the *same* practiced for 11 years on James River, on a farm less *kind* in proportion to fertility, exhibited a regular improvement.

Before taking leave of this branch of my subject, I must insist on the importance to a great product, of a close and regular distribution of the corn stalks—one only in a place—to prove which, I will give the result of *one* of the many experiments I have made. A frost occurred in *this county* in the spring of 1834, which cut down the corn below the surface of the earth, and appeared to have totally destroyed it. Field No. 3, was in that crop, 80 acres of which had been nicely weeded out with hoes and ploughs. I caused 3 intermediate rows to be laid off and planted in rare-ripe, making 6 on a bed of 14 feet width. A genial shower having occurred in the course of a week, the six rows came out together most beautifully. The first planting of course had the preference: but of the rare-ripe, five rows were left in the richest, *convenient* part of the field. One corner, containing 4,000 square yards, lying in such shape as to be measured with accuracy, (the corn no better than the balance similarly planted) yielded 14 barrels of fine ears.

You, Mr. Editor, as well as your readers, are doubtless heartily tired of No. 1., but in justice to the three-field system, I must be allowed to dispose of the remainder of it. The tobacco and corn land being done with, that portion of the field requiring cleansing of pests, is put in oats: the fairest crop of clover—that is, that which is most clear of pests, which is generally on the hills in each field—is reserved for fallow in August and September. Thus, as regards the clover fallow, mine is a modified three-field course. The whole field having been sown in wheat this fall, will be laid down in clover and other grasses, according to quality of soil and other circumstances, from the first of January to the middle of April, always applying plaster where the young clover assumes three leaves—which depends on the season. I will here remark, that I have succeeded best with clover sown in January. The open condition of the earth, from the effect of frost, takes the seed in deep enough not to be operated on by a sudden thaw which might cause them to vegetate on the surface, thus exposed to frost, and that still greater enemy to clover, drought: whereas, when buried more deeply, the seed vegetate at a later and more regular season, and are protected against being thrown out by the former, or killed by the latter enemy. With all spear grasses, (under which I class those in most common use with us, that is, timothy, herds, and orchard grass.) I have found most success, (*after* the months of August or middle of September,) when sown from the 15 h March, to the same date in April, because of the peculiar liability of these to be thrown out by frost, and therefore, their requiring good roots to resist it.

When the farm-pens are broken up in March, the whole of the manure from *them*, as well as that which has been made in the stables since the winter top-dressing on wheat, is hauled out and ploughed in on tobacco, corn, and oat lands, which being in clover, require light and partial manuring. After that period, all that can be made by littering stock of every description liberally, is reserved for top-dressing at the time of sowing wheat, if there is leisure, (which I rarely have,) and during the frozen spells of winter. I find the stable manure best for winter dressing, as it goes further, being little more than well stained straw—and from its warmth, separates more easily in frozen weather than others. I also top-dress very liberally with wheat straw, thinly scattered on poor or galled spots of the wheat field, for which there might not have been a sufficiency of manure. The crop of young clover is insured by such dressing—as I have found plaster to act most efficiently on unrotted manure. I consider all top-dressing more or less injurious to *wheat* (unless harrowed in at the time of sowing, and in that case thoroughly decomposed,) as it affords a nursery for insects during winter, which prey on the crop in early spring.

Let me here take a passing notice of the modern system of reserving all the manure of a farm, for *surface manuring*. Among the objections to this plan, these strike me as most prominent. In the first place, the loss to the land which it is destined to enrich, of the fermenting process under furrow—this I consider material. Then the waste in the manure itself, from evaporation, and *very* often, the total destruction of it from *fire-fang*. Suitable spells for applying it in winter, are precarious--and if the whole offal of a farm, as well as the leaves of woodlands convenient, are converted into manure, it will be found that the ordinary force of a well regulated, and of course, profitable farm, cannot accomplish the hauling and scattering of the *whole* stock. There are other seasons at which the teams and hands of a farm, on which due attention is paid to the division of labor, cannot be profitably employed unless in hauling and collecting manure or materials for it. Few applications of manure are more profitable, I consider, than that of covering the thinner parts of a clover field, after that portion intended for cultivation has been attended to. In these, the clover shoots through the covering before the scorching suns of summer occur, and protects the manure from evaporation, while the plant is generally repaid by the nourishment it receives. To conclude this chapter, let me pay a just tribute to that *multum in parvo*, plaster of Paris. Removed from the benefits so providentially given to the tide water country, in the abundance of marl and lime at command, we should feel that our region

was shut out from the face of nature, but for this richest of earthly blessings as a boon bestowed on us, for the wisest and most beneficent of purposes—though by injudicious practice, it has, I am sorry to believe, been productive in *its early abuse*, of as much injury as benefit to dear old Virginia. The practice to which I allude is that, of first stimulating the earth to an unnatural product of clover, and then robbing it of every spice—the result of this great effort—by the scythe and grazing, unaided by standing pasture, which is indispensable to *any improving* system.

I have thus, Mr. Editor, given you a faithful transcript of this record of my *practice*, as far as it goes. Could it have been abridged without mutilation, or doing violence to the unpretending object of the writer, it would have been: and I may add, should its destination, in a luckless moment to your readers, be the columns of the Register, instead of its more appropriate *shelf*, they may be assured, that tedious as is the task its perusal imposes, *they can not* be more objects of commiseration, than he who seeks in so dull a detail a solace from labors that he would fain forget, in that crowning reward of the farmer's toil, which a domestic fireside *alone* can give.

James River having gathered into her garners the greatest share of the profits of Virginia agriculture, and her farmers occupying, justly, the highest eminence of its fame—far as I am from detracting from either, especially the latter ascription—I should be recreant to the land of my adoption, were I to withhold from it the designation of my signature.

RIVANNA.

From the Genesee Farmer.

MANUFACTURE OF IRON.

At a time when all the world is awake on the subject of rail roads, and the mania respecting them promises to be as extensive as that which once existed for canals—when companies for their construction have been incorporated in Great Britain, sufficient to consume all the iron that can be produced in that country for two years to come—when more than 3000 miles have been projected in this country, for the iron of which we depended on foreign countries, but for which recent events show we must mainly rely on ourselves, it is matter of congratulation that a process has been discovered which will greatly reduce the price of the article, by nearly doubling the quantity which a given amount of labor and cost will produce.

This improvement has been introduced by Mr. Nielson of Scotland, and consists in *heating the air* used for the blast of the smelting furnaces. It is effected by passing the air from the bellows through red hot cast iron pipes, by which its temperature is raised to 6 or 700 degrees of Fahrenheit, and the current will melt lead and sometimes zinc. Formerly it was necessary to convert the coal into coke, by which about one half its weight was lost; now the coal is itself used, and this great loss is averted. In 1829, by the old method, three furnaces produced 111 tons of iron, using 403 tons of coke, to make which required 888 tons of coal. In 1835, by the new method, four furnaces made 245 tons of iron, using only 554 tons of coal. So intense is the heat produced, that to prevent the melting of the cast iron lining near the nozzles of the blow pipes, it has become necessary to substitute for the solid lining a hollow one, through which cold water is constantly passing.

The theory of the operation of the heated air is thus explained by Dr. Clark. By an examination of the quantity of air consumed at the Calder iron works, he found that 2867 cubic feet per minute was used, which at the temperature of 50° Fahrenheit, would weigh two cwt., or six tons of air an hour. This quantity of cold air thrown into the furnace acts as a prodigious refrigeratory on the hottest part of the mass, and must materially reduce its temperature. By previously heating this current of air, it is at liberty to act in promoting combustion, without robbing that combustion of any of the heat thus produced.

From the New York Express.

GEOLOGICAL WONDER.

At the United States Quarry in the village of Kennebunkport, Maine, where they are now quarrying large quantities of a strong, rich and beautiful granite—take it altogether, perhaps the very *best* building material on earth, inasmuch as with all its other good qualities, it rings like cast iron, works admirably and easily, and has been subjected to a heat of seven hundred by Professor Cleaveland, without flinching—the workmen have just discovered a rift or dike, which, had it been planned by the most skilful engineer, and executed at a cost of fifty thousand dollars, for the sole purpose of draining the quarry, and enabling the proprietors to work it to advantage, could not have been more judiciously contrived or executed. It has been cleared to the depth of twelve or thirteen feet in one place, and thoroughly sounded through its whole extent—is about six feet in width, of unknown depth, full of loose earth, which may be shovelled out, leaving a *straight*, *smooth*, *perpendicular wall* on each side, the whole extent of the quarry. It is now under contract, and will be finished to the depth of twenty or twenty-five feet in some places, by the first of January, 1837. A covered drain will be left as they proceed. Thus it is that nature—perhaps it were not irreverent to say the God of Nature—provides, ages and ages beforehand, for the wants of man! This dike, or fissure, which must have been caused by an earthquake, or some other tremendous convulsion of our earth, centuries ago, for the walls are too smooth, and the soil too loose and uniform, to admit of almost any other supposition, will be of immense advantage to the quarry, and could not have been *imitated* even by blasting, which would have ruined thousands and thousands of tons of this beautiful stone at an outlay of not less than fifty or a hundred thousand dollars.

I observed at the stone yard of another company (the Kennebunk Rail Road and Granite Company,) who are at work in the neighborhood of the United States quarry, (which by the way belongs to the Maine Quarrying Association—) a most beautiful front of hammered stone, intended for your Lafayette Place. I know not when I have seen a better work, or a material to be compared with it; and yet I am satisfied that a much darker and richer stone will yet be obtained at this quarry as

well as at the other, where the dike has just been discovered. I am told moreover, that Cox, Marshall & Co. North River, part proprietors of the United States Quarry, have put up some forty stores in different parts of New York this year, and that they are now building a magnificent hotel of the same. This is as it should be—but the stone they have been able to get hitherto, is altogether inferior to that which they are quarrying now. With the resources of Maine, and the capital of New York, wisely and cautiously applied, what may be done?

From the Silkworm.

THE MULBERRY IMPORTED FROM FRANCE BY MR. WHITMARSH.

[We cannot concur with the Editor of the *Silkworm* in admitting the least possible excuse for the conduct which he exposes in the following statement. A cheat has been perpetrated—most shameful in its manner, and enormous in amount and possible ill consequences to the new silk business of our country. Even if it were *credible* that a person so well informed as Mr. Whitmarsh is said below to be, on this subject, could have been so *deceived* by others, as soon as he knew of the fraud, he ought to have hastened to expose it fully, and to offer pecuniary compensation to all purchasers, to the full amount to which *he had profited* by the fraud. By not doing this—and still more by continuing to maintain the value of his "Chinese Mulberry" seeds and plants, by a new description, Mr. W. has fully established his claim to the highest place among the numerous tribe of *wooden nutmeg venders*. Ed. Far. Reg.]

Many persons have expressed their disappointment, and consequent dissatisfaction, respecting the seed and trees purchased from the stock imported by Mr. Whitmarsh, and sold by him and his agents, as the *Chinese Mulberry;* and several have named it with angry feelings, as a fraud which ought to be exposed.

It is not the object of the "Silkworm" to investigate the conduct or characters of persons, either public or private; and if it were, it would be a painful task to the editor: but justice to the little insect whose name the publication bears, as well as to those individuals who are devoting their time and property to its propagation, in the honest hope of gain thereby, renders it the editor's duty, as a faithful purveyor, to omit no effort conducive of a supply of the best food, and to expose as far as possible, every attempt, from speculation or any other motive, which may counteract that important object.

Mr. Whitmarsh is a gentleman whose character, it is believed, stood fair before the public, previously to this transaction; and the deep interest he has taken in the silk business has given his name considerable celebrity. That celebrity, while it serves justly as a shield from the imputation of an improper act, would also serve in an equal degree, if he were disposed to commit that act, to increase his power to give it more extension, and consequently more injurious effect. Every person should be considered innocent until proven to be guilty. If Mr. W. is innocent of the charges against him, it will be doing him a kindness to give an explicit statement of the complaints, that he may meet them with his defence. At any rate the great importance of the silk interest requires that it be guarded against its imposition.

The white Italian mulberry was of Chinese origin, and is as well entitled to the appellation of Chinese mulberry as the Morus Multicaulis. But the recent arrival of the latter in this country, and its annunciation, *with all its blushing honors* "thick upon it," as the *Chinese Mulberry*, at the most critical moment in the silk history, which can ever occur, has identified the Chinese mulberry and the Morus Multicaulis with a kind of sacredness not to be violated without doing injustice to the feelings of every friend to the silk interest in America.

At the time of Mr. W.'s departure for France, the seed of the Chinese Mulberry, was a thing sought after above all earthy treasures, so much so, that $500 per pound have been offered for it, and the young trees were worth $300 per thousand; and their estimated value has rather increased than diminished. Mr. W. must have known these facts, both in reality and in prospect. In the possession of this knowledge, he purchased in France, or elsewhere, a quantity of seed, and of young trees of some kind. The seeds were put up in small papers of about one quarter of an ounce each, and labelled in French as the Chinese Mulberry. These trees and seeds were shipped to New York and announced for sale, by his agent there, and by others at Northampton. They were sought after, and bought with unexampled avidity. Whether the trees were of the true Morus Multicaulis or not, we have no means of determining. We procured a few of them, and set them in our nursery, and many of our friends did the same; but as no one of them that we have heard from, lived, we have no means of judging to what species in the horticultural catalogue they belonged. Fortunately, however, owing to some seasonable caution, our investment in them was small. But not exactly so with the seed. We purchased fourteen papers, amounting to seventy dollars. These were sowed in excellent land, with every precaution which could ensure success. The papers contained a little over 2000 seeds each; of these seeds about 700 came up, which amounted to one seed in forty of those sowed. With the most careful attendance some of them have grown to about a foot in height. They appear very similar to the seedlings of the white mulberry grown by the side of them, but show no relationship to the Morus Multicaulis. The same results have followed in every instance we have heard from. Not a single tree has lived that we know of. From the reports we have obtained of the seeds, they have vegetated in about the same proportion —one to forty, and the product is the same; little, if any, dissimilar to the common white mulberry —altogether different from the Morus Multicaulis.

The true measure of value in any commodity is the mean rate in the estimation of its possessor, and of those who may become so. The comparative value of the Chinese and white mulberries differs as much in the public estimation, and probably in the ultimate estimation of truth, as gold and copper—at any rate, more than copper and silver.

That Mr. Whitmash well knew the state of the public mind with respect to the Morus Multicaulis, and also that the names Morus Multicaulis and Chinese Mulberry were considered perfectly synonimous, it would be absurd to doubt. That he did procure, or that somebody in his name did procure, young trees, of some kind, and sell them in a state so dry and decayed that few if any have lived to declare their species--that seeds of some kind were thus procured and sold in his name to a vast amount at about $160 per pound, knowing that the purchasers considered them the true Morus Multicaulis, and bought them as such, are also facts not to be doubted.

Now, it is possible that Mr. W. may have been imposed upon in his purchase of seeds and trees, and had no intention to deceive the public: at least we wish it may appear so. But at any rate the public has been most egregiously deceived.

It is in vain that the Northampton prints announce to the public, when the transaction is all over, that there is no deception; that they were the Chinese Mulberry—not the Morus Multicaulis, but a better kind. With similar grace, the honest Jew pedler sells a *cold vatch*, well knowing that he is understood to mean a gold watch. The reputation of the Chinese Mulberry stands too high to be injured by speculation.

We impute no dishonest intentions to Mr. Whitmarsh, or to any one else in particular. We have only stated facts, which show that there has been deception somewhere.—Ed. S. W.

From the Genesee Farmer.

LEAVES OF TREES FODDER FOR CATTLE.

A remarkable feature in the agriculture of France, and in most warm countries, is the use of leaves of trees as food for cattle. Not only are mulberry, olive, poplar, vine and other leaves gathered in autumn, when they begin to change color, and acquire a sweetness of taste; but spray is cut green in July, dried in the sun or in the shade of trees in woods, fagoted and stacked for winter use. During that season they are given to sheep and cattle like hay; and sometimes boiled with grain or bran, to cows. The astringency of some leaves, as the oak, is esteemed medical, especially for sheep.

From the Western Farmer.

ON TRANSPLANTING.

There is no operation more important to the agriculturist than that of planting out fruit trees; because, if properly performed, the benefits of the operation are for himself and for his posterity. Hence the damage of introducing improper practices, founded upon unsound principles in planting.

Having observed in your November number of the Western Farmer, some "Notes on Transplanting," copied from the New York Farmer, recommending the planting out of trees without lopping off any part of the top or branches—and apprehending that the reasoning in favor of that practice is incorrect, and might mislead, to their injury, the confiding and inexperienced, I beg leave to offer a few observations on the subject.

The author of these "Notes," it appears to me, reasons badly, when he draws an argument in favor of his new theory, from the fact of the greater success in planting a young tree "with its limbs and roots entire," than "the larger one with the system of decapitation practised upon it." He infers that the difference arises from the amputation of the branches—whereas it proceeds from the greater loss of the roots, in digging up the larger, than the young tree. In removing a young plant it is quite practicable to retain a much larger proportion of the extremities of the small fibrous roots, adapted to the introsusception of the plant, than of a large tree. There can be no doubt that the roots are more essentially the life-sustaining members of plants than the branches—therefore, when a tree (small or great) is removed, the chance of its living depends more upon retaining a due proportion of its most essential members.

The soundness of theories may sometimes be tested by pushing the principles on which they rest to their extremes. Let us see whether the theory here controverted can stand this test.—Plant a young tree with its branches and roots entire—it will live. Cut off a branch, it will live—cut off several, it will still live—nay, cut off the whole, leaving only the stem, and it will not only survive, as a thousand instances have proved, but being sustained by the roots, it will put new branches and will flourish.

Plant another tree with its branches and roots entire—try the same process of amputation on the roots—and ere you reach the last root, the branches will wither, and the tree will decline and die.

An argument in favor of the new theory is attempted to be founded on a supposed analogy between vegetable and animal life. "But (says its author,) would any person in his senses think of cutting off a child's arm, because it had the misfortune to lose its foot?" Certainly the author of the notes, in this question, loses sight entirely of the supposed analogy. The food of an animal is not constituted an organ to receive through its pores nourishment for the sustenance of the body, as the roots are of a tree. The stomach of an animal is this organ. Now let as suppose the stomach to be wounded or impaired, so as not to be able to perform adequately the functions of receiving, preparing, and furnishing the body a due portion of food. What is the consequence? Why, by an invariable law of nature, the bulk of substance to be supported must be reduced, the body and limbs fall alway, and dwindle sometimes almost to a skeleton. But when the stomach recovers its tone, and performs properly its functions, then the body and limbs begin to recover, and finally assume their wonted size and fulness. So when the roots of a tree have been reduced or impaired, to a degree which leaves them incapable of supplying adequate nourishment for the whole tree, body and limbs, the same law of nature ordains, that a portion of the substance to be supported, must be reduced—the limbs wither, dry, and decay: and who ever yet saw a dry dead twig, restored so as to vegetate?

As then, in the cases supposed, art is *incapable* of reducing the bulk of the animal, but nature is competent both to reduce and restore—as art is capable of reducing the bulk of the tree, leaving only as much as can be supported by the appen-

dant root—and as reduction, of the bulk to be supported, is indicated in both cases when the sustaining organs are impaired, it would seem that the analogy is clearly in favor of trimming off a portion of the limbs, so as to leave the top of the tree proportioned to the remaining root.

But further—is not this new theory entirely at war with the system of pruning? done for the double purpose of preserving the tree, and improving the fruit—a system which has stood the test of ages, and has the sanction of experience, the best guide to young agriculturists.

But facts are the best arguments in these matters; about 30 years ago, I transplanted a pear tree into my garden. It was seven inches through, dug up in December in freezing weather. To save it, I trimmed off most of the top, so much as to admit of its being carried into a cellar to preserve it for the night from the frost. Next day it was carried a mile and planted. It is yet a good bearing tree. About ten years past I transplanted a bearing Junetting apple tree more than half grown, cutting off most of the top. This year it bore the best and largest apples of any Junetting tree in my orchard.

Some four or five years past, a neighbor of mine transplanted from the forest to his yard a very uncommon and beautiful tree, bearing berries: desirous of saving the top, he trimmed off none, and the tree died.

Such facts could be advanced without number.

A CURE FOR THE RED ANTS.

The evils of this little visitant are well known to perhaps every house wife, and perhaps nothing would more exhilirate the domestic circle than the discovery of a remedy for the red ants. Such discovery I have made and wish you to communicate to the public through your useful paper. Common salt is a complete barrier to the approach of the red ant. Let the salt be so placed that they cannot approach the place from which you wish to exclude them without passing over it, and the remedy is complete. For instance, if you wish to exclude them from the cellar cupboard or any moveable cupboard, if it has no legs make artificial legs to your cupboard, then provide something suitable to hold for each leg of the cupboard, a pint or quart of salt, in which place the legs of the cupboard, and set it free from every thing else so that nothing can creep on to it without passing over the salt, and the remedy is complete. Having tested this remedy for two seasons I have no hesitation in recommending it as a complete cure. *Worcester Ægis.*

SCIENTIFIC DISCOVERY—SOLID AIR.

At a late sitting of the French Academy, there were presented some specimens of solid air. Every one could touch and handle them, see them dissolve, escape from the fingers and recover again the state of gas without leaving any traces. The pieces were divided, distributed, every body could taste them, and feel the impression of extraordinary cold which a solid gas produces, when returning to the state of air; or rather it was observed with surprise, that a substance, the touch of which congeals mercury and spirits of wine, and causes the thermometer to descend to 90 degrees below zero, did not produce on our organs of sensation the cold that might have been expected. It would seem as if our senses were not capable of appreciating such a low degree of the atmosphere; it is a new sensation which is unknown to them, and which they are unable, so to speak, to describe.

We have said that there were specimens of solid air, but it was not the atmospheric air, the air that we breathe, which was shown by piece meal to the academy, but we so speak of it, to make more apparent what there is remarkable, and truly astonishing in the fact. For people in general, there is but one sort of air, that which surrounds us, and if we had said that we had succeeded in making solid gas, this fact would appear very simple, and would perhaps pass unnoticed. It would be thought that gas is a chemical production which can bend to its laws, and whose condition can be altered by the scientific at will, without having any right to call for the attention of world. As to the air which we breathe, it still enjoys its reputation as an element—it is one of the powers of nature—it is one of the great constituent bodies of the world, and if we learn that man has succeeded in governing it, changing its condition, we expect to see him overturning the order and harmony of things. We forget that air is a gas like any other, a compound gas, which has not resisted the agents of decomposition at the disposal of the learned. To be more explicit, the carbonic acid gas, formerly known under the name of fixed air, of which we breathe a certain quantity in the surrounding air, is the true air which has been compressed, the little particles of which are drawn together, to the state of water in the first place, and then made solid, as water itself becomes solid in freezing.

It is from an enormous cylinder of cast iron, capable of bearing a pressure of more than 60 atmospheres, that M. Thiorien has obtained the liquid carbonic gas. By allowing the gas to escape through a very small tube, it is seen to spread itself out under the form of a snowy vapor—it is sufficient then to direct the flowing of this vapor into a tin box, when it may be seen to unite itself, becomes a mass, and soon it may be collected, pressed like common snow, and placed in a glass vase. It was under this form that the solid carbonic acid was presented to the Institute by M. Delong, to whom M. Thiorien handed several masses which he obtained from his apparatus, placed in an apartment adjoining the hall where the Academy was in session. We cannot sufficiently applaud the perseverance and devotedness of the author of this discovery. Much courage is necessary to manage an apparatus so powerful and so dangerous.

ON THE SOILS SUITABLE FOR COTTON, TOBACCO, SUGAR, AND THE TEA-PLANT.

By H. Piddington.

Read to the Agricultural and Horticultural Society of India, 5th March.

[We are indebted to Dr. Richard Harlan of Philadelphia, for the following recent communication to the Agricultural and Horticultural Society of India.

It will be gratifying to every agriculturist who has devoted much inquiry to the nature and constitution of soils, to find that an intelligent observer and practical chemist, like Mr. Piddington, is engaged zealously in that investigation. Though we do not agree with all his particular conclusions here stated, the facts from which he deduces them are valuable; and such observations, continued, cannot fail to lead to correct and instructive results. But though believing Mr. P. to be mistaken, (and no wonder that he should be, when he is compelled to reason from so few facts—) we fully concur in his general opinion, that it is all-important to know what are both the actual and the desirable chemical properties of soils, for the purpose of being enabled to succeed in producing, in perfection, most of the valuable crops. For some, lime in some form is important, as in the case of wheat—or absolutely necessary, as for clover—or necessary in great quantity, as for sainfoin. For some of these, gypsum is also absolutely necessary to produce a full crop, while to most others, it is of no service. Every valuable crop is made better, by the soil having a moderate proportion of lime in some form—because no soil can be a good one without. But most crops, and cotton is one, contrary to Mr. Piddington's inferences, require but a small, if any, amount of lime in the form of the carbonate, (or such as will show effervescence with acids,) though they will grow well in highly calcareous soils. Thus cotton is the great market crop on the excessively calcareous prairie soils of Alabama, and also on the acid pine soils, (showing not a trace of carbonate of lime,) of the Carolinas, and part of south-eastern Virginia. We have in different parts of this work, stated our reasons for believing that a highly calcareous soil is essential to grape and wine culture—and have attributed the general ill-success of that culture in America, to the fact, that no vineyard here, has such soil. We also stated the belief that calcareous soil is unsuitable to tobacco—and that the superior flavor of American tobacco to any made in Europe, is probably owing to this general difference of composition in the soils of the two countries.

Mr. Piddington is anxious to obtain, and requests through Dr. Harlan, specimens of tobacco soils from Virginia, and of cotton soils from South Carolina—such, it may be presumed, as are most friendly to both these crops. It is hoped, that some of the readers of the Register, whose location and opportunities permit, will comply with this request, and aid Mr. P.'s future investigations, by selecting and minutely describing the specimens, and sending them to the care of Dr. Richard Harlan, Philadelphia.]

I preface what I have to say to the Society on the soils placed on the table with a few remarks, which I trust may be thought worth placing on record. My object in doing so, is again to impress upon members, of what vital importance it is to the advancement of the agricultural interests of the country, and to the safety and success of every agricultural speculation, to procure samples of all soils from other countries in which valuable products grow.

The same climate and soil are, we know, in a greater or less degree, the essential requisites for obtaining the productions of one country in another; and for our present purpose, we may, perhaps, say that plants *find* their food in the soil, and are enabled to *digest* it by the climate. They *do* digest we know, and this in the strictest sense of the word.

The popular ideas of climate are vague enough, but it may be roundly asserted, that scarcely one who uses the word, knows what is really meant by soil; or rather, what is really meant by "the *same* soil." This arises from our vague notion of the thing itself. The very words used to distinguish soils, express more frequently than any thing else, their appearance and some of their physical qualities; scarcely any their essential—that is, their chemical properties. We talk of light and heavy, of sandy and clayey, moist and dry soils, which are all physical properties, and two clayey, or two sandy soils, may be actually as different as light and darkness from each other! The words ferruginous and calcareous are, it is true, chemical terms, but such vague ones that they designate whole *classes* of soils, of which, each sort is widely different from its neighbors. The tea soils and the Arracan tobacco soils on the table are both ferruginous soils, but differing as widely as soils can do; for the iron in the one, is a carbonate of iron, and in the other, the red oxide of iron.

Cotton.—Nothing then but a sample of the soil and a correct analysis of it can assure the speculator, that while he is trying to rear any given foreign product, he is not (misled by loose names) absolutely blundering in darkness, and attempting an impossibility. I begin with cotton as a most prominent example, though my proofs on the subject are not quite so full as I could wish; and I shall surprise the society not a little, when I say, that all the expensive efforts which have been made hitherto to obtain good cotton, have probably failed from this one cause—*that we have been at work on the wrong soil!* How far, with the American cottons, differences of climate may also have operated, is not here the place to examine, but vegetable productions do, to a great extent, acclimate themselves; while it is probable, that nothing can compensate to them the want of a principal constituent of the soil. Now I have not been able to obtain specimens of the American cotton soils, but I have good authority for stating that the soil of the Sea Islands is wholly a calcareous sand—in other words, a light chalky or shelly soil; so that it may probably contain from 50 to 60 per cent. of calcareous matter, (lime generally in the state of chalk,) and we have been attempting to grow this cotton on a soil which barely contains a trace of it! The soil of the Botanic Garden, for instance, not containing more than 1½ or 2 per cent: Indeed, we may say generally, that, till we reach the *Kunkur* districts, none of the soils of lower Bengal, out of the reach of the inundations, contain any great portion of lime. I showed some years ago,* that the inundations deposite lime, and that much of the fertilizing effect they produce is due to it.

The American cotton is then, on account of differences of climate, a case not strictly in point: but the Bourbon cotton—grown both at Bourbon

* Trans. of the Physical Class As. So. Vol. 1.

and the Mauritius—which sells for a shilling, when the Sea Island sells for 13½d. and the Manilla cotton which sells for 11d. when the Bourbon is worth a shilling, are both cottons of hot climates like our own; and both these are grown in highly calcareous soils. The soil on the table before you is from the Mauritius, it is sent me by M. Geneve, of La Riviere Noire, one of the finest estates on the island, as an excellent cotton soil, and contains 32 per cent. of carbonate of lime; (or in plain English, one-third chalk,) there is, moreover, phosphate, and perhaps sulphate of lime; altogether, perhaps, not less than 40 per cent. of calcareous matter! Its iron too is in a peculiar state, that of protoxide, or the black oxide of iron; and in this respect, it probably resembles the black cotton soils of Southern India. No wonder that the Bourbon cotton, though it grows well in many of our gardens near town. where it meets with plenty of calcareous matter amongst the lime-rubbish with which most of them are filled, is said to degenerate when cultivated in the open fields which do not contain 2 per cent. of lime. I know, from the experience of several years, that it does *not* degenerate, if it is duly supplied with calcareous matter; but that it will produce most abundantly, and for years, cotton worth from 10d. to 11d. per lb. in a proper soil. If the soil does not suit it, it will produce little else than leaves and wood, and the staple will deteriorate. Samples of American cotton soils are wanting now, to make our theory on this head perfect; but I would advise no man to attempt foreign cottons in a soil containing less than 15 per cent. of lime, and its iron mostly in the state of protoxide, or black oxide.

Tobacco.—Tobacco soils are the next, and here we are more fortunate, for there are on the table soils from Arracan, (Sandoway,) a soil from Singour in Burdwan, near Chandernagore, the tobacco of which, though of the same species as that of the surrounding country, sells at the price of the Arracan sort! and the soil of the best Bengal tobacco, which is grown at and about Hinglee in the Kisnagor district, near factories formerly held by me. Col. Hezeta and Dr. Casanova are our authorities for saying that the tobacco soils of the Havana are *red* soils, and those of Manilla, I know are also *red* soil. Now the red and reddish brown soils contain most of their iron in the state of peroxide, or the reddish brown oxide of iron; while the light grey soils contain it only in the state of protoxide, or the black oxide of iron. I believe the quality of the tobacco to depend mainly on the state and quantity of the iron in the soil; while it is indifferent about the lime, which we have seen is so essential to cotton. None of these tobacco soils contain any lime. Their analysis shows them contain—

	Arracan soil.	Singour soil.	Hinglee soil.
Oxide Iron, (peroxide,)	15.65	10.60	6.00*
Water and Saline Matter,	1.10	0.75	1 50
Vegetable matter and fibres,	3.75	1.10	75
Silex,	76.90	60.65	87.25
Alumina,	2.00	4.50	1.50
	99.40	97.60	97.00
Water and Loss,	60	2.40	3.00
	100.00	100.00	100.00

* Mostly protoxide.

—from which it will be seen that the best tobacco soil we have hitherto found in India, contains 16 per cent., or nearly one-sixth of iron, which is mostly in the state of peroxide, and that the inferior sort of tobacco grows in a soil containing only 6 per cent. or one-sixteenth of iron, which is, moreover, mostly in the state of protoxide or black-oxide.

I thought it worth examining what the quantity of iron in the different sorts of tobacco would be; and I found that, while the ashes of one ounce, or 430 grains, of Havana and Sandoway cheroots gave exactly 1.94 grains or 0.40 per cent. of peroxide of iron, the ashes of the same quantity of the Hinglee or best Bengal tobacco, only gave 1.50 grains, or 0.32 per cent., and it appears to exist in the first two in the state of peroxide, and in the last as a protoxide of iron; rendering it highly probable that the flavor of the tobacco, to the smoker, depends on the state and quantity of the iron it contains! for we have now, observe, traced the iron from the soil into the cheroot. Green copperas water, which is a solution of sulphate of iron, is often used by the American and English tobacconists and planters, to color and flavor their tobacco; and this would be decomposed by the potass of the tobacco, and sulphate of potass and carbonate of iron be formed. Carbonate of iron is of an ochre-yellow color. I took care to ascertain that this process had not been performed with the cheroots used for my experiment; and I do not believe our Bengal cheroot-makers know of this method.

Sugar.—Sugar seems to depend both on the state of the iron and on lime in the soil. The sugar soil before you is also from the Black River, (Mr. Geneve's,) an estate upon which, from 3,000 to 7,000, and even on one spot the astonishing quantity of 12,000 lbs. of sugar have been obtained from an acre, or from 12 to 150 bazar maunds per bigah! Captain Sleeman is my authority for these statements.

Now the peculiarity of this soil is, you will observe, that it is a *red* soil, i. e. that its iron is in the state of peroxide; and it contains, moreover, about 9 per cent. of carbonate of lime, with probably some sulphate and phosphate of lime, say, perhaps, altogether 10 or 12 per cent. of calcareous matter. We have in many instances endeavored to cultivate this cane on soils, destitute both of peroxide of iron and lime, and we complain that the cane has been found watery. It is clear that the cultivator who would succeed in sugar should pay attention to these peculiarities; for without doing so, he may have *returns*, but often no profits. His profits, in a word, may depend upon his canes, his cotton or his tobacco being *fed* with the food which they require. I use the words *feed* and *digest*, because it cannot be too often repeated, that plants are living beings, and that the vigor of their life depends, as with ourselves, on abundant and suitable food.

Tea Soils.—The tea soils, though I notice them last, are not the least interesting. The first, is a soil from Assam, for which I am indebted to Captain Jenkins, and the second, is from the Bohea Hills in China, sent round by Mr. Gordon, the Secretary to the tea committee, and obligingly given to me by Mr. Grant, of the Honorable Company's Export Ware-house. How very alike they seem,

you will at once have noticed, and their analysis gives as follows:—

Tea Soils.

	Tea soils of Assam. Surface soil.	At 2½ feet deep.	Tea soil of China.
Water,	2.45	2.00	3.00
Vegetable matter,	1.00	0.80	1.00
Carbonate of Iron,	7.40	6.70	9.90
Alumina,	3.50	5.45	9.10
Silex,	85.40	84.10	76.00
	99.75	99.05	99.00
Traces of phosphate and sulphate of lime, and loss.	25	95	1.00
	100.00	100.00	100.00

There are two peculiarities in these soils, the first, that they contain no carbonate of lime, and only traces of phosphate and sulphate; and the next, that their iron is almost wholly in the state of carbonate of iron—a widely different compound from the simple oxides. They would be called poor yellow loams; and cotton, tobacco or sugar cane, would probably starve upon them; but we find that they suit the tea plant perfectly. It is a striking coincidence, that we should find our tea soils and those of China, so exactly alike.

I fear to grow prolix, though I have much more to say on the subject of soils; I shall therefore break off, trusting that for the present, I have amply shown the necessity of a careful examination of the soil; and that the commercial public, who can do so much for us in this way, will not neglect their own interests in procuring specimens of soils for us; for to go to work in ignorance of this great element of success is absolutely to blunder on in the dark, where chemistry could lend us an unfailing light.

ON THE ORIGIN AND HABITS OF THE CUT-WORM.

To the Editor of the Farmers' Register.

Dear Sir:—In resuming so early, the subject of "Entomology," after the long discourse I lately gave you, on the "Hessian Fly"—and, moreover, laboring under the misfortune in the former, as well as the present instance, of controverting, if not *catholic* opinions, at least such as are very confidently asserted—I fear you will view me in the light of a *polemical heretic*, delighting more to shake the faith of others, than to establish one for myself.

But, to the point—my subject, at present, is the far famed "Cut-Worm."

In your present, November, No. of the "Farmers' Register," I this moment read an extract from the "Cultivator," which, indeed, I had seen *in extenso*, in this inestimable "periodical," in regard to the origin of that destructive insect.

The writer commences his hypothetical remarks, by which, he flatters himself, he has arrived at the truth, by asking the question, "to what species, can they be attributed?" He, then, satisfies himself they are not propagated by the "Coleopterous tribe, (beetle,) because he has examined *several* species of this tribe, and has invariably found their larvæ, of pale yellowish or light brown color; whereas the cut worm, he adds, is nearly black, and very *different* in its *habits*." Upon these vague grounds, and this course of reasoning, he *concludes* it is the "*cicada*."

This entomologist, though deserving of much credit, for his zeal in a branch of science in the common estimation of minor importance, yet, in reality, of much magnitude, has considerably erred in his mode of inquiry, as well as in his conclusions.

The question is, to what order do they belong? These may possibly follow the genus, and finally, the species. And these questions can be answered, by means of *experiment* alone.

His method seems thus; "*several* species of beetle have their "larvæ" of pale yellowish and light brown color—whereas these are nearly black." Therefore he concludes, the origin of the "cut worm" cannot be a "beetle." This argument may be dismissed as a "*non-sequitur*," and needs no further comment. But he adds, "it is very *different in its habits*," from the "coleoptera" order, inasmuch as the "cut-worm is *periodical*," thereby meaning, as subsequently appears, "not annual."

If the "cut worm" be *periodical*, its *periods* are *woefully short*, as the mortifying experience of the farmers of Maryland, at least, will attest. Annually in a greater or less degree, and often *disastrously*, for may successive years, do these grubs lay waste our corn crops, in numbers manifestly dependent on the peculiarity of the seasons, and other such natural and general causes, favorable to their propagation; and not upon any law of "*periodicity*." But in what does the "cut worm" differ (as he alleges,) in its *habits*, from the coleopteras? It is the character of this order to *nidify* in the *ground*: and to *subsist* in the "*worm*" state, upon the *roots*, and *succulent parts* of *vegetables*. Does not the "cut worm" *nidify* and *subsist* in the *same manner*?—Undeniably it does.

Insects of this order, also continue in the noxious "worm state," many as long as one, two, three, and some genera, as long as four years: ("Vid: Goldsmith's Animated Nature, vol. , title, *Beetle*,") devouring the tender roots, stocks and blades of whatever vegetables they meet with, yet, having their preferences. In fact the *whole habits* of the "coleoptera" family characterize the "cut-worm" with the most remarkable precision; and I will presently show "without argumentative assistance," that the gentleman's *conclusions*, as well as his *premises*, are wholly erroneous.

In a No, of the "Cultivator," also of the present month, an anonymous writer, "A Watervliet Farmer," pronounces the origin of the "cut worm" to be a "*moth*." His experiments are too small to be relied on—at first made with *one living* "cut worm," which as he thought, produced a "moth fly;" but he admits "he had a great number of the moth fly in his windows:" these might readily have caused his "moth" chrysalis. Secondly, his "larvæ" produced from his two other "moths," were all, he says, found *dead* when he first discovered them; and from his own narrative, they were too *microscopic*, especially in their lifeless and necessarily contracted condition, to be identified with any degree of certainty.

These gentlemen, without doubt, honestly believe what they have published: the one that he

had proved the "cut worm" to originate from the "cicada," an hemiptera; the other as certainly from the "moth," a lepidoptera: and the learned and indefatigable agriculturist, Judge Peters, of Pa., believed and published them to be the product of the "scarabæus volvens," a "coleoptera;" and I feel a *moral certainty*, derived from what I hold to be "*infallible experiment*," that neither the "*cicada*" nor the "*moth*," nor the "*scarabæus volvens*," is the parent of this Gorgon insect.

In consequence of Judge Peters' paper, in which he represents the "scarabæus volvens" (the common tumble bug) to be the parent of the "cut worm," and which he had, no doubt, taken at second hand—I was induced, (in 1819) shortly after his publication, and without any reasoning on the matter, as to what it *might* be, or what it *should* be, to make experimental demonstration of what its origin *really was*—Vid: American Farmer, vol. 1, p. 124—title "Entomology."

I offer below an extract from the paragraph containing this experiment; simply remarking that I have, "since," repeated it with similar results; and I am quite confident that all who will take the trouble to test it will bear witness to its verity.

"To come at the fact, I carried into the cornfield a large transparent bottle, which I half-filled with earth—upon this earth I deposited a dozen of the worms, and gave them corn plants to feed upon. In a few weeks they disappeared. I searched the earth and found them "chrysalids" enveloped in balls of earth. A considerable time after I again examined them, and found several of them matured into the imago, or *parent* bug, and extricated from their *envelopes;* others in the state of a soft "pupa," with limbs more or less distinctly formed, in various stages of progression, and exhibiting unequivocal proofs of their origin, and of the impossibility of mistake or deception. These destructive animals belong to the order "coleoptera" of Linn., having crustaceous elytra, or wing cases, which shut together and form a longitudinal suture down the back. They are about one quarter of an inch long, generally, and of a shining jet black color, very quick and active in their movements; in fact, the same identical bugs that are seen in vast numbers under wheat stacks, and in wheat yards. The brief history of this insect is, that its larva having fed upon the young corn, or other delicate plants, descends into the earth about the depth of four inches, where it assumes its state of "*chrysalis*," in which it continues till about the first of July, and no doubt, a shorter or longer period, as the weather may be more or less favorable—when it becomes transformed into the imago or parent, which in autumn deposites its eggs in the field, to undergo a similar series of transitions, which is effected by the heat of the ensuing season.

"The obvious *preventive* is *fall* or *winter ploughing* at such a depth as will turn up, and expose to the frost, the eggs, whereby they must perish."

The above *preventive* was not offered as original, it had before been practiced, perhaps by many, and its effects had fallen short of their hopes; first, by the imperfect method of too *shallow* a *furrow*, and too *wide* a *slice*, whereby the eggs were not sufficiently exposed. Secondly, because the eggs of all insects are, unfortunately, so tenacious of the principle of *vitality*, as to resist a degree of cold incredible to those who have not witnessed the fact: yet having long practised the proposed preventive, I can say in the fullest truth. that when the work was well executed, and a very *mild winter* did not ensue, I have received a full equivalent for the labor.

Finally, I must apologize for subjoining my name contrary to the general custom, "I perceive," of your correspondents. May I presume to ask what motive can occasion this custom? Certainly an *anonymous* statement of *facts*, or even of *opinions*, carries with it less confidence than one which offers the *responsibility* of a *name;* and with diminished confidence, the purpose is diminished in effect. The name freely tendered, "of a witness to facts," is a considerable assurance of, at least, a *belief* of their truth; he may be deceived, but it is justly said '*humanum est errare;*' and ordinary liberality will not impute to him a wanton misrepresentation of his impression of facts. Modesty is commendable; but in this custom, there is rather something of the "*mauvaise honte.*" As well may a public speaker, or a witness in court, conceal his identity behind a curtain. The *cause*, and the *effect* would seem to be the same. Excuse these remarks and believe me,

Yours respectfully,

JOSEPH E. MUSE.

Cambridge, Md., Nov. 20, 1836.

For the Farmers' Register.

THE DIFFERENT ADVANTAGES OF LARGE AND SMALL FARMS CONSIDERED; AND THE INJURIES CAUSED TO AGRICULTURE, AND TO A NATION, BY FREQUENT AND INJUDICIOUS CHANGES IN THE OUTLINES AND LIMITS OF FARMS.

The statesman who plans and achieves an important change in any of the political institutions of his country, is rarely able to foresee the effects and extent of its future operation. However hurtful may have been an old abuse, its removal has probably introduced other unexpected evils, which though of less magnitude, serve at least to detract from the benefits of the change. This truism is not a reason for opposing all proposed reformations—but it directs us to enter on even the most plausible, with the utmost caution and circumspection—and to doubt the existence of alleged universal and unmixed good effects of any past changes, until long experience shall have confirmed the truth of such opinions. The institutions which have long directed the accumulation and distribution of property, are the most endangered by the tampering of political reformers. It is in the regulation of property that errors are almost impossible to correct, even when their disastrous consequences have become apparent and certain.

The manner in which land has been distributed among the inhabitants of any country, and the degree of permanency with which land-marks are preserved, and existing possessions are held, produce all-important effects on the interests of agriculture, and on the prosperity of an agricultural nation. Yet this action has been scarcely noticed by those who have either caused, or suffered, the most effectual attacks on the interests of agriculture. Whenever the distribution of landed pro-

perty has been changed, whether by patriotic statesmen, or self-interested demagogues, the future effects on *personal* rights and power were only considered. There is no measure of our government to which these general remarks apply, more truly than to the destruction of entails and the right of primogeniture, in Virginia. The principal object of this measure, (and probably the only effect foreseen by the great statesman and pure patriot who proposed and carried it through,) was to insure the preservation of the equal political power of the people, by putting down forever the influence of the "landed aristocracy." But while the general, and repeated division of land was producing its intended and legitimate object, it has also been slowly and silently, but most effectually, assailing the agricultural prosperity of Virginia. This opinion will meet with few avowed advocates—indeed, not one, unless he is both fearless of popular censure, and careless or hopeless of popular applause.

Passing by the most apparent political tendencies and benefits of our existing legal policy of distributing lands, as a measure of state, I shall proceed to inquire into the incidental and unnoticed operation of the system on agriculture; and, through agriculture, on the public wealth and prosperity. It is not my intention to treat the question, (though well it deserves such extended examination,) as belonging to politics or government, or morals—nor as affecting the feelings, prejudices, and happiness of individuals—but simply as a disputable point in political economy, particularly involving the interests of agriculture.

It has long been a subject for discussion, whether large or small farms are most profitable to their owners, and consequently most conducive to public wealth. In Britain, particularly, this discussion has engaged the attention of every able modern writer on agriculture; and every fact and argument have been adduced, which could be brought to support either side. There, strong reasons could be urged in favor of small farms, (say of 30 to 200 acres) which would not apply to us: as for example—that the cultivated parts of the island were already generally divided into small farms, and that a great sacrifice of fixed capital (in houses, fences, &c.) would be caused by throwing 10 or 12 such farms into one: that the laborers on large farms were discouraged from marrying, and in consequence, that the increase of population would be obstructed, and the morals of the laboring class thereby injured. But notwithstanding these reasons, which cannot apply to a slaveholding country, and also other reasons, which are of general application, it is the decision of the most enlightened agriculturists of England and Scotland, that large farms are most profitable for the owner, the occupier, and also for the nation.

This deduction may be right, or wrong: and at any rate, I do not advocate the adoption of such opinions on mere authority, though supported by such names as those of Young, Sinclair, Brown, and Coke. But *if* their opinion is correct, that small farms are least profitable, where land is rich, and its product is sold for high prices—where the system of landlord and tenant is almost universal—where small farms were already general—where the laborers were free, and the farmers themselves were accustomed to aid as well as to superintend the performance of every operation—then much more certain must be this truth in this country, where all these circumstances are found reversed. But let us examine our situation in this respect, without reference to, or comparison with other countries.

Both large and small farms possess peculiar and opposite advantages; and the interests of a country would be greatly injured, by its land being universally, or even very generally, kept in either very large or very small divisions. Let me not therefore be misunderstood as supporting a state of things equally absurd in theory and impossible in practice, when I shall state the peculiar advantages of either plan of division, or contend for the superiority, in particular respects, of the one size over the other. It is also requisite, in discussing the respective advantages of large and small farms, to dismiss from our minds every argument built on the personal and peculiar characters of different individuals. An industrious, economical, and intelligent farmer, however inconveniently situated, may derive more income from his capital than his indolent and wasteful neighbor, possessing ten-fold advantages: and yet no such fact, nor any number of them, will prove the situation in which the former was placed, to be better than that of the latter.

The small farmer, who works only one or two horses and three or four laborers, and who himself labors as well as directs, possesses the great advantage of being able to exercise the most perfect economy and industry in the management of his farm. If he drives, feeds and stables his own horses, he can derive the utmost amount from their labor, and they, the greatest benefit from his care and attention. Almost nothing is lost by waste or neglect, because the farmer can see, or attend every thing. All the various little savings from such sources, are sufficient to cause the provisions, stock and labor of the small farmer, to be more efficient *in the particular manner in which they are directed*, than an equal amount of capital employed as part of the expense of a large farm. But the manner, or plan, of directing capital and labor on small farms, is necessarily and greatly inferior to that on large farms, for reasons that will presently be offered. By making the best use of the economical advantages just alluded to, many of the small farmers of Augusta county are more thriving than most of our richest landholders: and if most of our farms were as small, and all their cultivators showed the same untiring industry and frugality, no doubt there would be a great increase of individual profit, and public wealth, in spite of all the disadvantages inseparable from small farms. But unfortunately, such examples are rare, because there are rarely found farmers so admirable for frugality and industry: and when the owner is lazy, improvident, or drunken, all the net income of a small farm will speedily vanish. In every case, the personal habits of the cultivator, whether good or bad, must more immediately affect the net product of a small than a large farm.

But notwithstanding the superior advantages that small farms enjoy, in many respects, it is still undeniable that on them the operations of agriculture can never be well performed, nor can the greatest net products be derived, nor the most valuable improved processes carried on, for want of the skill which only a division of labor can pro-

duce; and still more, for the want of the best utensils, machinery &c., which can only be used on large farms. It is well known that the profits of all complicated manufactures depend greatly on the extent of the establishment: for example, that a cotton factory may be highly profitable if suited to employ 200 laborers, and yet ruinous if the works were erected only to employ 20, because many expenses to be incurred must be nearly as heavy in the small, as the large establishment. Precisely the same causes of profit and loss are to be found in the extent of the operations on different farms.

Let us suppose the existence of two neighboring farms of the average fertility, (or rather I should say, the average poverty,) of lower Virginia, and similarly situated, except that one is in size 1000 acres, and the other only 100, and both cultivated by slaves, in numbers suited to the respective farms. On the first, the owner can afford, (and the expense is for him true economy,) to keep good teams, the best ploughs, and a wagon to convey his crops to market. He has sufficient farm-houses, and costly machines of the best construction suited to prepare his crops for market, such as a thrashing machine and fanners for wheat, or a good gin and press for cotton, &c. His income permits his employing an overseer of the best mind and habits that can be obtained. His extensive operations enable him to profit by the division of labor, and thereby improve to the utmost the skill of his laborers, each in his respective department. It is not every man who can learn to be a first rate ploughman, and for even those so gifted, long practice with good implements is indispensible. In the case we are supposing, a few men selected for their qualities from thrice their number, are kept through a large portion of year at ploughing, and have every means to perform perfectly that operation, upon which so much of the success of tillage depends. The same remark applies to every other operation, for which good or expensive utensils, and much skill in using them, are required. When accidents or disasters occur, by which the cultivation of a large farmer loses labor, implements, or even expensive fixtures, his income enables him to supply the deficiency, without incurring the still greater loss that would probably be caused by delay, or the inability to remedy the evil. He is not compelled to sell his crops at inconvenient times, or at the lowest prices, but may supply the market according to the demand existing, greatly to the benefit of the public as well as himself. Similar examples might be greatly extended, but these will suffice for the purpose of comparison: and in every such case, an application of the same circumstance to the small farmer will make evident the unavoidable disadvantages under which he labors.

If the owner of 100 acres makes wheat, he must prepare it for market by the slow and wasteful process of treading out by horses, as his crop is not large enough to justify the expense of a thrashing machine; and if he had one, his laborers would be too few and too unskilful to use it. Implements of less value, and suitable teams, he may (and certainly ought to) have; but the fact is notorious, that on such a farm, and on many much larger, it is very uncommon to find either a good fanner, plough, harrow, or a well matched pair of horses. There can be scarcely any division of labor, nor of the skill caused by it, as of the two or three men employed, each has to do something of almost every operation. From these causes every process will be performed not only imperfectly, but at great loss of labor, and perhaps of crop also. If the owner employs an overseer, he must be at the lowest wages, and generally of the most worthless kind. But the more common course is for the farmer to be his own overseer—and as there are but few who labor regularly themselves, or who do not withdraw a large portion of the time from the actual superintendence of their slaves, (who only work when compelled,) there will necessarily follow the loss of much labor and product to the farmer, and be much consequent diminution of the public wealth. To pursue the parallel, the small farmer loses a horse, or his best slave—and as he has no means of supplying the deficient labor for a considerable time, to the first loss there is generally added another, equal to a third or half of his growing crop, for want of the labor so lost.

The large and the small farm are alike burdened by the erection and repairs of a dwelling house, barn, stable, &c. for each: and though these buildings will be more costly on the large than on the small farm, still the latter is far more heavily taxed in this way, in proportion to the income or capital. If the total necessary expenditure for buildings on the large farm (1000 acres) be $4000, the small one (of 100 acres) will certainly need $1000, which is more than double a proportional amount.

Finally—wealth is not always (nor indeed often) accompanied by education, intelligence, and public spirit—nor does poverty always banish these qualities and their valuable effects. But yet no one can deny that every benefit from these sources that has served to improve the state of agriculture, has been owing to the occupiers of large farms. Examine the history of agriculture as far as it is known, and no considerable improvement has ever been introduced by the small farmer.

The full consideration of this subject leads irresistibly to the conclusion, that large farms, (not too extensive for one man to superintend, or for the advantageous employment of the requisite labor,) are the most conducive to both the profit of the owners, and the public wealth. But however true may be the general proposition, God forbid that some future political Procrustes should have the inclination and power to put it into practical operation, by throwing our small farms into large ones, as effectually as the statute for the equal distribution of lands serves to cut up both large and small farms into still smaller divisions. The enormous losses that this policy has already produced to agriculture, and to the commonwealth, cannot be remedied nor lessened—and it is equally vain to hope for any cessation to the same disastrous course. If our landmarks could henceforth remain permanent, or be altered only when both public and private benefit would be promoted by the change, then the existing divisions would serve to produce all the benefits from large, as well as from small farms. But the course we have pursued, and still continue to pursue, seems to fix upon ourselves all the evils of the worst planned divisions of land, with the additional and still greater evil of endless change.

Let me repeat, that I am not treating of the equal distribution of land among the former own-

er's children, as a measure of state, but only as it affects the interests of agriculture. If the establishment of this policy was necessary to secure our freedom and political rights, then was that object wisely purchased by almost any sacrifice of pecuniary interest. But I confess that I view this dread of the ascendancy of the "landed aristocracy," as altogether unfounded—as the fear of a shadow, of which the substantial cause had never reached this country, and which was then almost expiring even in England. We have now left but few specimens of the nearly extinct "landed aristocracy" of Virginia, which serve to show how powerless men may be, although possessed of 5 or 10,000 acres of land. These gentlemen, on the average, are neither more nor less estimable than their poorer neighbors of equal intelligence: yet so completely are they disfranchised by their wealth, that I doubt whether any one of them could exert as much electioneering influence as some constable of the same county, or could successfully compete for public office with any respectable deputy sheriff.

If government did not interfere with the accumulation and distribution of land, and array our prejudices and feelings in support of its policy, the matter might safely be left to be decided by men's sense of self-interest. But government itself, has has been the great disturber of our landmarks—and in Virginia, the means that are acting to produce this effect, and all the incalculable consequent losses, is the total repeal of the statute of entails, and the substituted legal policy of equal distribution of land among the heirs of intestates.

The proprietor of every farm, whatever may be its size, throughout his whole occupancy is directing his labor and improvements to render his land convenient and profitable according to its then boundaries and extent. He considers that a certain portion of it should be arable, and perhaps he is for 40 years gradually clearing woodland to attain that object—and this arable land will most probably be in one compact body, and on one side of the farm, because such is usually the most convenient plan. Another portion of suitable size is left in wood, to supply fuel, and timber for fencing. The dwelling house is suited to the degree of wealth and the wants of the family of the farmer—and his farm-houses, to the amount of his crops and live stock. All these arrangements we will suppose completed, when the owner dies intestate, and the law divides his well arranged farm among five or six children. The commissioners appointed to make the division, may use the utmost care to guard the interests of all the heirs, and yet, (if there are minors among them,) they will scarcely avoid a loss of property equal to one-fourth of all the land. All the buildings being contiguous, they will seldom fail to fall within a single share: and though buildings in such cases are never valued at half their worth, (on account of their new owner's situation,) still even at that low estimate, that share receives so much in buildings, that it must have but little in land. The new owner will possess houses numerous and extensive enough for a farm of 600 acres, while his whole possession amounts to 40, without timber or fuel, and which cannot rent for enough to keep his houses in repair. Of course they go to decay, and the greater part of their value is an entire loss to the owner, and to the country.

The next share, or perhaps two of them, may include part arable and part woodland. The owner of such a share may be deemed fortunate, as it *may* be kept and cultivated as a farm, though under great disadvantage, as soon as the owner shall have erected suitable buildings, and made new fences. This expense, however, is another total loss or diminution of the value of the property, caused solely by the previous division.

Another share may probably be altogether of cleared land, without any materials for fencing or fuel—and the remaining ones altogether of woodland, which the owners' whole lives would not enable them to clear, and put into order as distinct farms. Neither of these shares would be worth even half their former value to the new owners.

Divisions producing losses of this kind are of every day occurrence, though under every variety of circumstances. Fewer heirs, or a different situation of the farm, may diminish the loss—more heirs, or a widow's dower right, may greatly increase it. But it is scarcely possible for any cultivated farm, (not of too great extent before,) to be divided into even as few as two shares, merely because it has two owners, without a considerable and permanent loss being incurred—and a public as well as a private sacrifice of property made.

But, it may be objected, that these heirs may sell their shares of land, and thus avoid the losses that would follow the retaining the property. It is true that they may sell, and the necessity of the case often compels a sale of the separate shares—but at what a sacrifice! If any of the heirs are minors, or if the widow lives and holds her dower right, no agreement can possibly be made for a general sale of the whole farm, which is the only way in which its former value can be preserved. In most cases, the sales are necessarily made separately, and for no greater sum than each share is worth to the particular heir, holding it alone. Nor can it be worth much more to the buyer, who is usually some neighboring farmer, whose other land only enables him to draw some income from a possession which was almost worthless to the unfortunate heir. He who is adding to his possessions by purchasing from time to time the inheritances of others, is also subject to great inconvenience and loss, in thus making a large farm by a patchwork of smaller pieces. To suit his new purchases to his own general plan, he has to clear woodland in one place, and let arable go waste in another—to pull down, or leave to rot, a building in one remote corner, while he is obliged to erect others in more convenient situations. If, in such cases the purchaser really gained *all the value* which the seller lost in his land, the public wealth would not be a whit diminished: but in truth, the difference in value, caused by dividing a farm, is totally lost to both buyer and seller—to the individuals concerned, and to the nation at large. The purchaser may afterwards so improve his newly acquired land as to make it worth more than before it was taken from the original farm: but if so, this new value will be entirely the fruit of his own industry and capital, and does not restore the former loss by division, which is gone forever.

Such divisions of farms must be expected to take place almost as often as the death of their owners occur; and each division probably causes an average irretrievable loss of value of 20 per cent. on each farm. The more that farms are re-

duced in size by this policy, the more heavy these losses must become—for large farms can be divided at a much less sacrifice of value than small ones. If we count the average loss from such divisions at one fifth of the value of the land, and suppose the average interval of 100 years before it will be necessarily repeated, (and this is moderate enough,) it amounts to the utter destruction of one fifth of the value of all our lands once in 100 years: aye—a destruction as complete and effectual as if one fifth of Eastern Virginia was swallowed by an earthquake. Is not this enormous, continual, and increasing drain from our private and public wealth, a cause sufficient of itself for the manifest decline of our country?

Besides the loss of capital which has been caused by our *patchwork* policy—(this regular system of cutting up farms, and then uniting the ill-assorted fragments into other farms, only to be cut up also in their turn—) there have been other consequences, not less deplorable.

The first is, that almost no improvement of the soil has been made, nor can half as much be expected in future, as would take place under other circumstances. Every farmer is either the owner of an ill-cut slice of some former farm, or he has made a large farm by patching together the detached fragments of several others: and in either case his main impovement, for a large portion of his life, must necessarily consist in laboriously *undoing* the improvements which were as laboriously made by his predecessors.

Secondly—every costly mansion, and even most good farm houses, become nearly useless after the death of the first owner; and consequently we are contriving to lower the scale of usefulness, as well as of cost, of all buildings in the country. Arab tents are inded better suited to our patchwork land policy, than substantial houses of brick or stone. Neither can we, with any expectation of profit, resort to the use of live hedges, or other durable and costly fences, as they would soon be rendered useless by the death of the owner, and by the consequent new dividing lines rendering new sites for fences necessary.

Thirdly—there have been very few farmers' sons well educated, since this impoverishing system has been in full operation—and the political influence and dignity of Virginia have sunk with the intellectual cultivation of the class that formerly upheld both.

It is true that when the shares of land that would be made by a division are so small and worthless that it is impossible for any one to draw a support from their cultivation, the law permits a general sale, provided that all the parties, and the next friends of minors, will concur in certain legal formalities, which seem to have been contrived for the benefit of lawyers, full as much as for that of the heirs. The trouble and cost of this proceeding amount to no small tax, and such cases scarcely deserve mentioning as very partial exceptions to the patchwork system.

The law forbidding entails and destroying the former right of primogeniture, certainly does not *compel* equal divisions of land; as every man may, by his will, keep his farm together, by giving it to one only his children. But the law forbids his continuing a like disposition of his land through future successions, which alone would effect a permanent benefit; and there is no inducement whatever for a father to make such distinction between children equally dear to him. The law has stamped with reprobation all such unequal bequests, though they are not absolutely forbidden: and under present circumstances, a father will best satisfy his children's expectations by dividing his farm among them, though at a sacrifice of one-fifth of its value. It would be both unjust and inexcusable, now, for a father to give all his land to one child, while to others were left legacies of much less value. But if the settled law of the land had so fixed the succession, there would have been no unjustice committed, nor complained of. The succession to property, in any manner whatever, is the creature of social institutions—and it ought to be so directed as will be most beneficial to both private and national interests. The popular arguments urged against the justice of entails, might be as correctly applied to prove the injustice of the rights to private property altogether, and of every institution of society, which enables one man to possess lands and moveable goods, while his equally meritorious neighbor is destitute of both. Yet every one who is above the grade of a grog-shop orator knows that the institution of the right of property is of inestimable benefit even to the most destitute class of every country.

The extension of the entail system in Europe has been a great public evil—and has served to obstruct the national welfare, as much as our totally opposite policy promises for ourselves. The permanency of landed possessions, and the facility of dividing and alienating them, are both to be commended so far as each course may produce public benefit—and either should be opposed when likely to cause injury to the commonwealth. An entail system that could serve to prevent both such accumulations and divisions of land as were manifestly unprofitable and injurious, and which would not prevent such divisions and alienations of entire farms, as the public interest might require, would prove of the greatest benefit to agriculture. Such a system would secure the object that I have endeavored to advocate, the permanency of the boundaries and existing value of farms, both great and small. The permanency of the succession in a particular family, is comparatively an unimportant consideration; and only worth the stateman's attention so far, as the expectation of that continued succession may prompt to greater individual exertion, and consequently, produce the greater ultimate benefit to the nation.

The statesman is wretchedly short-sighted who does not aim to direct the institutions of his country so as to receive support and strength from the folly and vices, as well of from the wisdom and virtues of mankind. Wisdom will thus derive support for the general welfare, from some of man's basest propensities—while ignorance will use his noblest qualities for the purpose of doing harm. Every individual is more or less influenced by avarice, or by a taste for prodigality; and both these evil dispositions may be exercised for the public good, under the entail system. Is the landholder a niggardly miser? So much the more will he value the permanent nature of his entailed land—and judging his posterity by himself, he will not suppose it possible that they will ever lose possession of the property. His most secure hoard will be the surface of his farm: his

savings will be vested in durable fixtures and buildings, as being more safe than bonds and mortgages: and however small may be the early or annual income from such investments, still it will be so much clear gain to his posterity and to the nation. The beneficial effects thus produced by the operations of avarice, would compare with the admirable labors and valuable products of the religious community of Shakers. In that singular society religious fanaticism and discipline counteract the usual tendency of property held in common—the corporate nature of the society, produces the same consequences as would the entail of their land—and the prosperity and wealth of the society, show the wonderful accumulation derived from their system of wasting neither time nor labor, and putting every surplus product to some immediate and productive use.

But suppose the landholder to be a spendthrift. Even in that case, his vice may be beneficially directed. The tenure of his property will probably induce him to erect magnificient buildings. or to form costly pleasure grounds and gardens filled with choice fruits and rare plants. Or perhaps he will undertake some visionary and costly improvement, which though a cause of loss and perhaps ruin to himself individually, will remain of permanent value to the country. These channels of prodigality under existing circumstances are seldom used: for even a spendthrift's calculations must show him that such expensive plans would not answer on lands which are so soon to be divided, and to pass thus divided into the possession of different strangers. To such a vent for prodigality and ostentation the civilized world owes the erection of piles of architecture in Europe, that will be admired for many centuries. If the noble canal which England owes to the enterprise and lavish expenditure of the Duke of Bridgewater, had proved an entire failure as to yielding profit—that is, if the expense had been so great that all the tolls on the canal, when completed were required to pay the the interest of its cost—then the whole cost of the work would have been lost to the constructor, and also to the general capital. But if, notwithstanding that the enormous cost of the canal had destroyed all hope of its yielding any profit to the undertaker, it still served as greatly as it has done to benefit trade, and to induce the construction of other valuable public works, better planned and more economically executed, then England would have been indirectly greatly benefited by the prodigality that had (according to our supposition) caused the Duke of Bridgewater's impoverishment. Without the existence of entails, men will certainly be not less disposed to indulge in lavish and ruinous expenditure: but their waste will be on costly entertainments, and ostentatious hospitality—the luxuries and fopperies of dress and of equipage—in hunting, racing, and gaming—and all other such transient and unproductive pleasures, which leave behind no monument of their having existed—except in ruined estates and impoverished heirs.

Under the operation of our existing policy the owner of a farm is discouraged from making any improvement of a nature that will have its value destroyed, or materially impaired, by the inevitable division of the land. The consideration that in a few years probably his farm will be cut up, and the value of his labors partially or totally destroyed, must affect all his important plans. But on an entailed farm, whether it contain 50 or 2000 acres, his judgment and feelings would concur in prompting a different course, and the one most advantageous to his country as well as to his successors. He would use no merely temporary expedients. His improvements and the arrangement of his farm would be intended to serve for ages to come. The durable fertilization of waste or barren fields, the erection of the most substantial structures, the planting of live hedges, fruit and timber trees, would be intended not only for his own benefit, but for that of his latest posterity. He would be both stimulated to act, and rewarded for it, by the belief that his works would last, and his name be remembered with gratitude and honor, for ages after his body had become dust.

CONSERVATOR.

For the Farmers' Register.

BELLS ON SHEEP SAVE THEM FROM DOGS.

Amelia County, December 12, 1836.

On looking around our homes on the various animals which man has domesticated and applied to his profit or pleasure, we should find great difficulty in dismissing any one from our service.

All, in their symmetrical relation and dependence, seem necessary to the circle. If called on to relinquish one, its value, like that of departed relations, friends and neighbors, would only then be justly appreciated.

Some could certainly be surrendered with less inconvenience than others; but should the sheep be demanded, what would be our alarm? The loss of our commerce, or the subversion of our institutions, would scarcely be greater evils. Yet how shamefully is this meek and defenceless friend of our race, neglected in our country?

Time, the mitigator in other cases of loss, could not bend us in accommodation to the circumstance. No other animal yielding a similar fibre, so necessary to our comfort and protection, affords it in such quantity, or is so much of the cosmopolite. In some climates, the fleece might probably be substituted; but several regions, now the abode of civilized man, would become depopulated.

It is probable our first parents levied their earliest contributions on this interesting animal, after their expulsion from the abode of innocent delights first assigned them. In the discord of elements and animals following the transgression, naked, shivering man stood exposed to the first, and our timid defenceless favorite, to the latter—each dependant on the other for protection. Hence, probably, in sacred writings, the useful and innocent lamb is made typical of the sure and only hope of the Christian, and the golden fleece among the meeds of highest achievements in profane story.

The superiority of one kind over another, is not intended to be discussed. The variety of the species is sufficiently great to meet our varied objects. Nor will the best method of rearing and keeping be detailed: ignorance on both branches forbids the undertaking. But, humanity, gratitude and justice, demand that they be fed, sheltered and defended against the lacerations and tortures of the midnight marauders, both biped and quadruped—

the last being the particular object of this communication.

For two years after it became my object to raise a flock equal to our domestic demand for wool, my stock rather diminished than increased, notwithstanding additions by purchases. This was ascertained to be the effect of nocturnal plundering, or rather murderings. Never till then did the atrocity of "sheep stealing" come home to my business and bosom. As my homestead is on the line of separation between the cultivated fields and the standing pasture, and the flock could seek protection near the houses, it was surprising this destruction could go on without detection in the act. Some of the culprits, however, fell under suspicion, and observation taught me they were shy, shrinking from observation, easily alarmed, and in pursuit, as voiceless as their victims. The conclusion was, that any noise might alarm the prowler, and drive him from his purpose. Bells put in motion by the flight of the flock, would probably draw attention. With this view, bells of the largest size suitable to the size of the animal, up to the highest tone audible at some hundreds of yards, were procured and fastened about the necks of every sixth or eighth sheep, by means of strong leathern collars. Nearly five years have elapsed, and up to this time, not one has been lost from this cause.

A neighbor who could not keep a flock before, purchased a new stock, and adopted the same expedient, and has since suffered no loss, at the last report.

To the lovers of good clothing as well as those of good mutton and music, a flock thus equipped, sending forth the agreeable chime as they pour along to the welcome salt, or file off to the field or fold, is no uninteresting spectacle.

This expedient may be no novelty—may be an old thing, neglected for its frivolity. Yet the rationality of the plan, so usefully sustained by experiment, is deemed worthy the sanction of my proper name.

THOS. MEAUX.

DOUBTS OF THE VALUE OF SOME OF THE OPINIONS NOW CURRENT ON AGRICULTURAL IMPROVEMENTS.

To the Editor of the Farmers' Register.

———— ————, *December* 16, 1836.

Sir,—In a desultory course of reading, I remember a long time since, to have met with a passage, in regard, I think, to Socrates, or if not him, some other of the sages of Greece, who being appealed to by his disciples on a disputation between them about "*the sovereign good*," (for in those days they had their favorite abstractions as we have ours,) answered their inquiry by another, "*good for what?*" Though I do not remember in what book I met with the passage, it has often occurred to me as applicable to a multitude of controversies that are carried on in our time, each of the disputants contending for some abstract doctrine, which in itself, is neither right nor wrong, true nor false, but may be the one or the other, according to circumstances. It would be an improper use of your columns, to illustrate this position by examples taken from other pursuits, but it may not be amiss to give some relating to husbandry, and I think, the question of Socrates, "good for what?" not inapplicable to several of your correspondents, who have recommended different applications of agricultural skill and labor, because they have succeeded in other countries, or with particular individuals here, or have taken sides as to the preference of one mode of husbandry to another, not with reference to circumstances, but in the abstract. I could refer to a large number of instances among the communications published in your Register, but will mention only a few; perhaps, you and your readers may justly think them more than enough.

The culture of silk was a favorite object of attention in Virginia, Georgia, and other parts of our country, at a very early period. The project seems to have been lost sight of for very many years, until lately, when it has been revived with increased ardor, to the north as well as the south, and has occupied no inconsiderable space in your columns. In the numerous publications on the subject that I have looked over, I do not remember to have met with one word of discouragement. I should not feel disposed, were it in my power, to discourage it altogether; but all will agree, that the difficulties attending it, if any, should be fairly stated, and that those who engage in it, should be enabled to act "*understandingly*."

Having paid some attention to this matter, I will give you the result of my inquiries, and certainly have no wish that my opinions should pass for more than they may be found to be worth.

From all that I have been able to learn, the silk culture has never been carried on extensively and with success in climates where the cold of winter is long or severe, or in countries that are not well peopled. In China, the breeding of silk worms, and the manufacture of silk, have been carried on for thousands of years, and at this time, employ a considerable part of the crowded population of that immense empire. It has long since been observed, and I believe, is undoubtedly true, that no two distinct countries, in the same parallels of latitude, resemble each other more in climate, than China and the United States. In turning over the pages of Staunton, Barrow, and other travellers in China, I was struck with the circumstance, that in going from north to south, they did not find the cotton plant an object of cultivation, till they came to about latitude 38, and then only on a small scale, till they had gone some distance further south; shewing a striking coincidence, in this respect, between that climate and ours. The culture of silk, does not seem to have extended so far to the north, by several degrees of latitude. In France, from all I can learn, and I have taken some pains in the inquiry, it is not extended further north than the banks of the Loire, though it has been attempted in Normandy, and other more northern parts of that country. In Italy, it is carried on as well in the extensive valley of the Po, as south of the Appenines; but this fertile region is fenced from wintry blasts by the lofty ramparts of the Alps, for its whole length from east to west, and its climate is much more temperate in winter than ours, and the length of summer greater.

If a mild temperature were the only requisite to preserve the life of the worm, this object might be attained by artificial means, and with due attention, the proper warmth of the apartment in which

they were hatched, might be maintained through the cold season, at the proper point, though not without much care and cost; but the worm cannot exist without food as well as warmth, and a constant supply of green leaves is absolutely necessary for its sustenance. Although attempts have been made to substitute other vegetables, I believe none have been found to succeed on a large scale but the mulberry; some varieties of which are said to be much preferable to others. The mulberry being a deciduous tree, can afford no supply of food during the cold season, as indeed, is the case with all other trees or plants, that have been recommended as substitutes. It is true, that the insect while in the egg, or in the chrysalis state, does not consume any, and it may be possible to preserve the eggs unhatched during the winter in a northern climate, and indeed, it must be so to a certain degree, or the culture of silk would fail entirely in Connecticut. But on the other hand, its want of success in a sufficient degree to make it an object in the south of Germany, the climate of which is not much colder than ours—in England, where it is milder, and this with the advantage of direct encouragement from the public authorities, by high premiums, &c. and in the more northern part of France, while it succeeds further south—leads to a strong, I may say a necessary presumption, that silk cannot be produced as a general object of cultivation in the northern states, or even so far north as Virginia. You will readily suppose that these views are not original. If they were, their value would be less. They are the result of information that I have collected from various respectable sources, and among others, from Young's *Travels in France*, a work of great and acknowledged merit, which is probably in your possession, or within your reach. If not, you may find it reprinted in Pinkerton's Voyages, &c. published by subscription in Philadelphia, about 1811, in six quarto volumes, of which there are many copies in the country. In chapter 23rd, "*Of the culture of silk in France*," Pinkinton, vol. 4, p. 569 to 580, are notes on the cultivation of silk in different localities, generally in the south of France. The whole might take up too much space in your Register, but if you can find room for the passage "*on Normandy*," in pages 571, 572, and for the latter part of the chapter beginning at page 577, "*Languedoc*," &c. both you and your readers will find a detail of it in facts, I doubt not, an accurate one, relating to this question, and a course of clear and forcible argument that will deserve your consideration, and I think, satisfy you, that silk can never become an object of general cultivation in Virginia. For myself, I am fully persuaded, that it would never answer on a large scale in our climate, even if the wages of labor were not so high as they now are, or are likely to be, for generations to come. Still, it is probable, that in one state of society, there are members of a large class of our population that might be employed in this way, without loss to the community, and with some advantage to themselves.

Throughout the continent of Europe, except some of the richer countries, such as Holland, a large proportion of the whole population is occupied in the culture of the soil. This is more or less the case in different parts of Ireland and Scotland, but not in England. On the other hand, great numbers of females are engaged in English manufactures. In this country, much field labor is performed by female slaves, but it is unknown to white females from north to south. The wonderfully rapid increase of our population, necessarily furnishes occupation to a great proportion of them, but there are many of the middling and poorer classes that want employment, while their male connections are laboriously engaged in providing the means of support for themselves and their families. It is true, that a number of families are employed in manufactories, but they bear a very small proportion to the whole, and we must take into account the comparative cheapness of manufactures produced by machinery, which has greatly diminished the amount of domestic manufactures, so that on the whole, there are not near so many females employed in this way as formerly.

It is neither to be expected nor desired, that the wives and daughters of our more independent classes of industrious men, who draw good incomes from their talents and application to business, should lead a life of toil; but if some new and useful employment suited to females in more limited circumstances, could be found for the numbers among them whose time is not taken up by domestic concerns, it would add much to their real comfort, and indeed, be a public benefit, greater, I think, in the northern states, but not to be disregarded in the southern. None occurs to me, at present, as being likely to answer this purpose better, than the culture of silk, though, I believe, the profit would be very moderate indeed—still it would be preferable to idleness. Occupation they must have, and the manufacture of domestic silks, is certainly better suited to them, than the wearing of foreign, in visits or excursions more or less expensive, far or near. It is but justice to add my belief, that it is not their fault that they cannot, at all times, find useful and suitable employment.

These remarks having been drawn out to a much greater length than I had thought of, when I began them, it might be better to stop here; but I will venture to add a few words on a topic which is thought a very important one, by many improving farmers throughout the United States—the improvement of our stock of cattle, by importations from the best English breeds. It certainly deserves attention, but is, perhaps, of less consequence in our southern grain and tobacco country, than further north, or among our mountains. Large sums have been expended in the importation of English cattle, and handsome profits have been realized by sales of their produce. The preference, I believe, has settled down in favor of the Durham short-horns; the bulls of that stock, commanding the highest prices in England. Much has been urged in their favor, in print and in conversation, and they are always mentioned as being emphatically a good breed; but the question, "*good for what?*" seems never to have occurred among us in regard to them. Most, if not all English writers on the subject speak highly of them, and among others, the last and probably the best work, the *Treatise on Cattle*, published under the direction of the Society for the diffusion of Useful Knowledge—but never in the abstract. They seem not to have gained a footing in the highlands of Scotland, the mountains of Wales, or the less fertile lands of these countries, nor

indeed of England. On fertile soils, where cattle are reared as well as fattened for beef, I believe they are pretty generally preferred; but the very extensive rich pastures that are devoted to the fattening of cattle only, are most commonly stocked by smaller and cheaper breeds drawn from Scotland, Wales, and those districts in England, where the pastures being thinner, are better adapted to breeding, than fattening.

The Durham short-horns grow to a large size in a short time, fatten kindly, and yield more milk than most other breeds, though it is admitted to be rather thin in quality; but the small proportion of bone to flesh, an advantage with the butcher, renders them too heavy and inactive for the yoke. I have heard it asserted that they thrive on our pastures, but think this must be a mistake. Like other animals, they must require food in proportion to their bulk, and a large short-horned ox or cow, toiling through a hot day, over a wide extent of thin pasture grounds, for a scanty supply of indifferent grass, would sadly disappoint any sanguine expectations from them. To pasture them on the single crop of clover admitted into our scourging rotation of grain crops in rapid succession, would be contrary to one of our canons of agriculture, and I believe, you and your correspondents will generally agree, would within a short period, reduce a soil not highly fertile to a *caput mortuum*.

Experience and observation have long since shown, that the native breed of cattle in every country, are accommodated *in size*, to the climate and supply of food. Those of our lower country, though very small, are often remarkably well formed; and by careful selection, and a better supply of food, in winter as well as summer, we might in time obtain a native breed, little, if at all inferior for our purposes, to any we could get from Europe. You will not understand me as objecting wholly to this favorite English race. In various parts of the United States there are rich pastures to which they may be very well suited, and even among us, a slight infusion of blood from cattle so handsomely formed, might add something to the beauty of our stock, and at all events, lead us into the habit of bestowing on them, and by degrees on our native breed, more care and attention than unfortunately it receives from us at present.

Permit me to add a "*few more last words*," on the question, "good for what?" as applicable to a very important object of our husbandry. The four-shift rotation, of two crops of wheat, a crop of corn, and one of clover, in four years, has not only been recommended by the example of some of our most successful cultivators of rich soils, but is proposed as a model for general imitation. With good cultivation, and good management of manures, &c. it may succeed on such lands—but if applied through the whole, or even the greater part of our wheat lands of a medium quality, both the crops and soil would be in a rapid course of decline. Indeed, I am by no means sure that this process is not going on at this time, on a very large proportion of our wheat soils. That this grain is generally put in, harvested, and prepared for market, better than formerly, I have no doubt, and I think it equally clear, that plaster and clover with proper management, tend much to the improvement of soil; but I cannot conceive the possibility of keeping up by this means the fertility of land, not of the first quality, from which three exhausting crops of grain are taken in a four-years' rotation. These crops would reduce the soil faster than the clover and plaster could restore it, and it could only be kept in heart by good supplies of manure, which the land itself could not furnish. This system then, can only succeed in a general way, by setting apart a portion of the land for pasturage, and keeping as good a stock of cattle, as can well be maintained through the winter, and thus providing a good supply of manure. If marl or lime is within reach, the task is much easier: less animal manure will be necessary, though I have no idea that it could be wholly dispensed with, and a larger proportion of the land may be kept under the plough. My objection is not to the four-shift course in itself, but to the attempt, vain and visionary as it seems to me, to carry it on successfully, without plentiful supplies of manure. These can only be obtained by good stocks of cattle; and agreeing with the advocates of the system, that the arable lands should be subjected as little as possible to the tooth and the hoof, the necessity for separate pasture lands seems unquestionable. I do not enter into the question, whether the four-shift system, with these limitations, be preferable to any other: very probably it may, on lands of a good quality. On middling or inferior soils, it might answer by throwing out for pasture a part of the arable lands, and taking pasture grounds into the rotation from time to time; or if the pasture lands are not suited to the place, it might be best to keep the same lands always in rotation of arable crops, or in pasture. Neither the four-shift system nor any other plan of husbandry is good in the abstract. The question always recurs—"*good for what?*"

These remarks are freely submitted to your consideration and censure, and those of your readers. They are hastily made, though I have reflected maturely on the subjects to which they relate. If they draw no attention, I am content: and if they are thought worthy of any notice, I trust, that though they may not themselves convey any useful information, they may lead to it.

With my best wishes for continued success in your useful labors,

I am, respectfully, yours,

——— ———.

BENGAL INDIGO. REMARKS ON CALCAREOUS MANURES.

To the Editor of the Farmers' Register.

Burlington County, N. J., Dec. 15, 1836.

* * * * *

A friend of mine, who returned last year from India, where he has been engaged for a number of years in the cultivation of the indigo plant, and in its manufacture, has brought with him a large quantity of the seed of that valuable plant of the true Bengal species, and he desires me to say to you, that if any of your correspondents would take the trouble, the following season, to test the practicability of its culture in your climate, he will forward to you for distribution, to any port you will name, to which vessels sail from Philadelphia, a box of the seed containing about five bushels. He has several other boxes of similar contents, which he

would send further south, if a disposition is shown to engage in the culture. His directions for the culture are very simple. It is usually sown broadcast, but it may, perhaps, be better cultivated in drills about two and a half feet apart, by those who would bestow a little extra pains. The proper time for sowing would be, in this country, about the usual time of planting corn. It will grow well on light sandy lands, that are suitable for the cultivation of rye. The ground may be rich, if it is intended for seed the first year, but for manufacturing into indigo, the stalks on rich ground contain too much gelatine, which is a serious detriment, both to the process of manufacturing, and to the quality of the article. In India, it furnishes two cuttings in the season; here, probably, but one could be raised. It is cut when about one-fourth of the blossoms have unfolded, and will require the same precautions in the curing, as clover hay, and in every respect, the same management. A simple extract from the green or dried plant, makes a very permanent dye, when set with alum; hence it may prove of value to those planters who manufacture any kind of clothing for their families. Mr. Haines, the gentleman alluded to, is so confident of its success, even in this latitude, (N. J.) that he intends to superintend the cultivation and manufacture of a considerable quantity the next season, and if he should succeed, hopes to be able to re-supply himself with seed from the south. He is firmly convinced, that with the means within the reach of southern planters, indigo may be made to rival any of their staple productions in value, particularly on lands which are too much exhausted for the cultivation of cotton or tobacco. His choice of land here is the pine region, which I suppose to be very similar to that of the south.

Accept my sincere thanks for the copy of your invaluable "Essay on Calcareous Manures." It has been my text book in my farming operations since I first met with it. We have been using marl (green sand) here for many years, and lime very freely for the last ten years; but I must freely acknowledge that I have been working in the dark until I adopted your excellent theory, as the basis of my operations with those valuable materials—and yet my library is not deficient in standard agricultural works and periodicals. In looking over your third volume, a few days ago, I was induced to make the following entry in my note book. You will do me a great favor by replying to it in the Register, as soon as convenient. "I observe in some remarks appended to an article from Sinclair's Code of Agriculture on 'Bones as a manure, and on the use of sea shells, shell marl, and coral, for the same beneficial purposes;' in the third volume of Ruffin's Farmers' Register, at page 600, the editor objects to the author's ascribing equal virtues to pounded oyster shells as to pounded bones, as a manure, and gives as a reason that oyster shells are entirely composed of carbonate of lime, except a *very small* portion of gelatinous animal matter. Now, I should like to know, from the worthy editor, how he reconciles this opinion with his experiment on fresh water muscle shells, dissolved in a weak mixture of muriatic acid and water, (Essay on Calcareous Manures, pages 30 and 31,) or whether the experiment will not show the same result with oyster shells—for on the strength of this experiment, without having heard of ground oyster shells having been used, (though I have since read of Mr. Coke's and other experiments,) I had determined to erect a mill for breaking them by horse-power, after the manner of the old fashioned bark-mills, used by the tanners."

———.

[For want of space and time, in closing this No., we must postpone for the next publication, the remarks which the foregoing letter calls for.]

From the Columbia (S. C.) Telescope.

TRIBUTE TO THE NORTH.

By Senator Preston.

Mr. Preston, in his speech concerning the rail road, on Monday last, drew a very striking contrast between the difference of character of the people of the northern and southern parts of the Union, and the consequently opposite condition of the countries that they inhabit.

He said, that no southern man can journey (as he had lately done,) through the northern states, and witness the prosperity, the industry, the public spirit, which they exhibit—the sedulous cultivation of all those arts by which life is rendered comfortable and respectable—without feelings of deep sadness and shame, as he remembers his own neglected and desolate home. There, no dwelling is to be seen abandoned, no farm uncultivated, no man idle, no waterfall, even, unemployed. Every person and every thing performs a part towards the grand result, and the whole land is covered with fertile fields, with manufactures, and canals, and rail roads, and public edifices, and towns and cities. Along the route of the great New York Canal, (that glorious monument of the glorious memory of De Witt Clinton) a canal, a rail road, and a turnpike, are to be seen in the width of perhaps a hundred yards, each of them crowded with travel, or overflowing with commerce. Thoughout their course, lands that before their construction would scarcely command five dollars the acre, now sell for fifty, seventy-five, or a hundred. Passing along it, you see no space of three miles without a town or village, and you are never out the sound of the church bell.

We of the south are mistaken in the character of these people, when we think of them only as pedlers in horn flints and bark nutmegs. Their energy and enterprise are directed to all objects, great and small, within their reach. At the fall of a scanty rivulet they set up their little manufactory of wooden buttons and combs—they plant a barren hill-side with broom corn, and make it into brooms at the bottom—and on its top they erect a windmill. Thus at a single stop you may see the air, the earth and the water, all working for them. But at the same time the ocean is whitened to its extremities with the sails of their ships, and the land is covered with their works of art and usefulness.

Massachusetts is perhaps the most flourishing of the northern states. Yet of natural productions she exports but two articles—granite and ice. Absolutely nothing but *rock and ice!* Every thing else of her commerce, from which she derives so much, is artificial—the work of her own hands.

All this is done, in a region with a bleak climate and steril soil, by the energy and intelligence of the people. Each man knows the public good is his individual advantage. The number of rail roads and other modes of expeditious intercommunication, knits the whole country into a closely compacted mass, through which the productions of commerce and of the press, the comforts of life, and the means of knowledge, are universally diffused; while the close intercourse of travel and business makes all men neighbors, and promotes common interest and common sympathy. In a community thus connected, a single flash of thought pervades the whole and, almost as rapidly as thought itself can fly. The population becomes as it were, a single set of muscles, animated by one heart, and directed by a common sensorium.

How different the condition of things in the south! Here the face of the country wears the aspect of premature old age and decay. No improvement is seen going on—nothing is done for posterity—no man thinks of any thing beyond the present moment. Our lands are yearly tasked to their utmost capacity of production, and when exhausted, are abandoned for the youthful west. Because Nature has been prodigal to us, we seem to think it unnecessary to do any thing for ourselves. The industry and skill that have converted the inclement and barren hills of New England into a garden, in the genial climate and fertile soil of the south would create almost a paradise. Our natural advantages are among the greatest with which Providence has blessed mankind, but we lack the spirit to enjoy and improve them. The rich ore is beneath our feet, yet we dig not for it. The golden fruit hangs from the bough, and we lift not our hands to gather it. The cask of delicious liquor is before our eyes, but we are too lazy even to broach it. In thinking, in writing, and in talking, we are equal to any people on the face of the earth—but we do nothing but think, write and talk.

From the Southern Agriculturist.

ON THE MANAGEMENT OF NEGROES, &c.

[Concluded from page 495.]

Having laid down some rules for preserving cleanliness among negroes, and attending to their diet, I proceed next, to the regulation of their morals and habits.

As soon as the negro is convinced that cleanliness adds to his comfort and ease, at home, he will unconciously practice the same, in discharging all his master's work. The slave, who has his head combed, and his face washed, and his clothes cleaned, will seldom be found neglecting his work in the field, or scratching his head, as is too often the case, when he should be at his task. Niceness and exactness in discharging his duties, will imperceptibly creep into all his habits.

Order.

To observe order in all things, is a precept of Solomon; and the planter who will cause his negroes to adhere to this wise admonition, will live an easy and agreeable life throughout the year. I have seen a certain planter, who always has his negroes at work: they are never idle; and yet, he is always behind the seasons. Now, this arises from the non-observance of order. If he would only cause his negroes to do every thing as the time, the place, and the circumstance demanded, every thing would be done right, and he would get along well. Preserve order yourself, in all your actions, and your negroes will imitate you. For instance, if you ride by a fence that has been broken down, and you have a boy with you, make him stop and repair it; if you have no boy, get down, and do it yourself. Let every negro about you, and on your plantation, be made to observe this. I make it an offence, severely punishable, for any of my slaves to pass by any thing out of repair, without either stopping to put it to rights, or informing the proper person whose business it is to do so. One rail supplied, when the fence demands it, will save a supply of perhaps twenty or thirty, a week afterwards. I have seen negroes pass over bridges which had great holes in them, fifty times, and never take the trouble to mend them, when one log of wood could easily have done so. If negroes of mine did the like, be they male or female, if they were old enough to have discretion, I would punish them for the negligence. Let it not be said that such exactness is severe. Practice makes such things easy to the slaves, and they find it much better for their own comfort in the long run. The master should make it his business to show his slaves, that the advancement of his individual interest, is at the same time an advancement of theirs. Once they feel this, it will require but little compulsion to make them act as becomes them.

Morals.

The planter should endeavor, as much as possible, to make his negroes adhere to moral rules. I know that to lay down any general code for them is idle. But then, a few particular rules may be strictly attended to. Among these, I particularly enjoin upon my slaves, the observance of their marrage contracts. In no instance do I suffer any of them to violate these ties—except where I would consider myself justified in doing so. Independently of the excellence of such an institution itself, it has the additional advantage of keeping your negres at home.

If there be a church in the vicinity of the planter's residence, he should oblige all of his negroes to attend it, at least once a day. This has an excellent effect. Most negroes take Sunday as their day of visiting; and it not unfrequently happens, that they do more mischief on that day, by colleagueing themselves, than on any other. Now, the attendance upon church permits them to meet their relatives and friends there, and, at the same time, keeps them out of all mischief. It is rarely that any one can attend a house of religious worship without gaining some wholesome information. And the slave will generally learn, at such places, the reasons which sanction the master to exact of him his respective duties.

Upon their return from church, I generally employ them in regaling themselves in different healthful and innocent amusements—such as will tend to keep them in good spirits with each other. I know that some persons will object to this, as a desecration of the sabbath; but, for my own part,

I cannot be persuaded that God's holy laws are violated in the innocent recreations of his creatures. But no more of this at present.

I have now, Mr. Editor, concluded my notions upon the management of negroes. I feel that I have said far less than the importance of the subject demands: but I hope that the little I have said, and the very imperfect manner in which it has been said, may induce others to give their notions likewise. We live by example, and, let me add, that much which is borrowed in this way, is immensely valuable. That every planter may recollect this, and that we may all do more than we have done, is the earnest wish of

A PLANTER.

For the Farmers' Register.

COMMERCIAL REPORT.

The extreme punctuality with which your Register is issued, caused my last communication to be too late for your December number; and as what it contained applies in some degree to the present state of affairs, a part of it may be embraced in the present report.

The cry of "scarcity of money," which has resounded for several months at New York, is now heard in almost every direction throughout this country, and is even echoed back from England. The commercial relations which exist between the two countries, are so intimate and extensive, that whatever affects the one, is soon felt by the other. The change made by us in the relative value of gold and silver, causing importations of the former, has created an alarm in England, and induced counteracting measures on the part of her monied institutions. The high rates of interest current in New York, (1½ to 2½ per cent. per month,) tended to attract capital from other quarters. Large amounts of American stocks were sent to Europe for sale, and the great demand for money on American bills, &c. created some alarm in London, where the rate of interest advanced from 3 per cent. per annum, to 5 and 6. The mere assertion, that money is scarce, tends to verify itself. Monied men are induced to withhold it, or to ask more for the use of it. I do not intend, however, to enter into any argument on the subject, but merely to state the fact, that a severe money pressure exists in the mercantile community generally, from which the commercial towns in Virginia are not exempt. The best paper cannot be readily discounted. Specie is drawn by one bank from another, and thus kept *in transit*, at an expense, but without benefit to either party. With a larger amount of specie in the country, than at any former period, there is less facility in the transaction of business, than heretofore.

Remittances cannot now be made from one part of the Union to another, unless at a great difference in exchange. As much as 3 or 4 per cent. exclusive of interest, being paid at New York, to negotiate bills on Virginia, and 5 to 6 per cent. on Mobile and New Orleans. Our internal exchanges are again totally deranged—the traveller from one part of the union to another, finds no currency which will pay his way throughout. Gold is not to be had, silver is too cumbrous, and local bank notes change their value according to distance, and to the tariffs of brokers.

Through the medium of foreign bills, a system of usury has been introduced in the larger cities, in which it is suspected that some banks, and even of those which are patronized by the government, participate. Bills on England, which are current at 8 or 9 per cent. premium, for cash, are sold at 12, 15, 18, even 20 per cent. on time, exclusive of interest—the same bills are probably thrown into market and sold at 8 or 9 per cent. for money.

The distribution of the enormous amount of surplus revenue, (to be taken from an accumulation of nearly fifty millions of dollars,) is looked to as a source of relief, a cessation of speculations in lands, in city lots, or in *cities to be founded*, will doubtless tend also to relax the pressure.

The preceding remarks were made last month, and although it is stated from high authority, that the rates at which internal exchanges have been negotiated, previously to the passage of the deposite act of last session, were generally below the rates charged during the existence of the United States' Bank, the experience of those who have had to make such negotiations, does not confirm this statement: on the contrary, it is well known to those who have had to transfer funds from one part of the union to another, that it has been attended with great difficulty, and sometimes considerable expense.

The causes of *existing* difficulties and derangements may be found in an exposition from another source highly intelligent and more experienced, than perhaps, any other, on the subject of financial arrangements and exchanges.

The crop of cotton in the United States is variously estimated at 1,500,000, 1,550,000, and even as high as 1,600,000 bales. Should the lowest number be realized, it is not reasonable to expect that present prices can be maintained. During the month of November, the price declined in Petersburg, from 17½ to 16 cents; and in the early part of this month, it was further reduced to 15½ for the best; but the planters having withheld their crops from market, a temporary advance to 16 cents was gradually attained. The demand has consequently abated, and a decline will probably ensue, unless the home demand shall require all that is brought to market. No advices have been received from Europe, later than 26th October, and shippers are entirely in the dark as to the state of markets there.

The low stage of the rivers in Alabama has prevented supplies reaching Mobile; but in the aggregate receipts at the various markets in the United States, there is already an increase of 50,000 bales, on those of December last.

Until within the last few weeks, the arrivals of grain from Europe were very considerable, but no statement has yet been published, to show the quantity. The profits to the importers were generally large; particularly on rye, which has been sold in some instances at four or five times the first cost in Germany or Russia. The quality of the grain is good, and the condition much better than could be expected, after being so long kept and subjected to repeated shipments. The ports from which the principal supplies are obtained will be closed by ice until the spring, and as it is thought that the wants of Europe will require all the grain which remains there, no decline in price can be expected in this country until after the next harvest. Wheat, of fair to good quality, com-

mands $2 to $2 25 cts. per bushel—Flour, $10 to $12—Indian Corn, 75 to 80 cts.—Pork, $8½ to $9 per 100 lbs.

Tobacco declined very considerably last month, and sales of old were made at a reduced price of ⅓ to ½ on the prices which it commanded a few months previously. The sales in November, were at $2 to $6 50 or $7, embracing very inferior to good and fine. Although the new crop is supposed to be very abundant, yet the supply during the present month has been inadequate to the wants of our own manufacturers, (who prefer it to the old,) and the price has advanced. Lugs command $2 50 to $5, and leaf $5 50 to $6—but these prices do not include fine qualities, none being yet brought to market.

The value of all descriptions of stocks has been very variable in the northern cities, and generally low. In Virginia they have not been subject to similar fluctuations, and considering the scarcity of money, command good prices.

The line of rail roads in connection with those already completed, from Raleigh to the Potomac, are in rapid progress. One from Petersburg to City Point is about to be commenced, and exertions are making to commence one from Weldon and Gaston to Danville and Evansham, one from Petersburg towards Farmville and Lynchburg, and one from Richmond to Lynchburg; but it is not reasonable to expect that all these projects will succeed. Another very important one is proposed from Lynchburg to the Tennessee line. For the extensive operations of the James River and Kanawha Company, I can only refer to the official report lately published.

Applications are before the legislature for the establishment of several banks, the want of which, is annually the more felt in consequence of the large investment of capital in manufacturing establishments, and works of internal improvement.

Another large cotton mill, (the Ettricks,) has been erected in the vicinty of Petersburg. The stock for one other, (the Mechanics,) has been subscribed and a third is about to be undertaken—all within a short distance of the existing establishments. Extensive iron founderies and mechanic shops are also erected at Richmond and Petersburg, which will soon be in operation.

The enterprising citizens of Danville and Milton on the Roanoke are also erecting cotton mills, and several similar establishments have been and are about to be erected in North Carolina. So that in the course of a few years, nearly the whole crop of cotton in Virginia and North Carolina will be required by the mills in those states—a very desirable result for giving employment to our white population.

It is hoped that the culture of silk will soon be introduced as affording a useful and profitable occupation to the numerous hands, whose labor is now inefficient.

X.

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